Project: FOTONIKA-LV

Unlocking and Boosting Research Potential for Photonics in Latvia – Towards Effective Integration in the European Research Area

Grant agreement no: 285912

Partnerships, Exchange of Know-how and Experience

WP1 - Final report with Annexes on two way secondment visits

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Version 1.0 final release

Release Approval

Name	Role	Date
Sandra Smalina	WP Leader	
Sandra Smalina	Quality Manager	
Arnolds Ubelis	Project Manager	

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1. Introduction

The exchange visits included in this work package are intended to ensure further development of the existing cooperation of FOTONIKA-LV with its strategic partners as well as initiation and development of new partnerships with the purpose of advancement of basic research and technology development.
In the project following objectives were identified for Work package 1:

1. To strengthen and to boost strategic partnerships with 10 leading European centers through trans-national two-way secondments of research staff;
2. To intensify and to develop new cooperation initiatives with at 10 advanced research institutes, through two-way secondments, incl. The Fraunhofer Institute for Systems and Innovation Research, through two-way secondments. These initiatives will foster training in science management, innovation culture and in technology foresight.
3. To share basic and applied research experience on cutting-edge photonics problems, including theory of atomic processes in high-power laser fields, bio-photonics, plasma spectroscopy and photonics, development of innovative light sources, satellite laser ranging, remote optical sensing in atmosphere etc., resulting in joint publications and new technology developments;
4. To enhance mobility of young and established researchers of the FOTONIKA-LV community, developing competence and expertise in photonics through visits and contacting colleagues at leading EU centers;
5. To benefit from synergy resulting from higher level research training of MSc, PhD students and young researchers working together with visiting scientists and having access to advanced research infrastructure at the University of Latvia and on site at strategic partnership institutes;
6. To collaborate in education & teaching programmes between FOTONIKA-LV and the EU partner universities to integrate photonic subjects into educational curricula;
7. To work together with partners towards achievement of long-term goals using the strengthened combined R&D potential through the joint use of research infrastructure. In particular, the opportunities offered by FP7 and FP8 calls at the European scale, and EU.

2. Two ways secondments between the FOTONIKA-LV research community at the University and strategic partners in the EU

During Project period from 01.02.2012-31.01.2015 active cooperation between FOTONIKA-LV and collaboration partners in listed below 10 strategic partnership institutes was sustained and secondment visits were also used for this purpose.
Totally in project period was spent almost 57.1 person months of secondment visits, from which **25 month and 19 days was secondments with strategic** partners and 31 month and 11 days was secondments with emerging and new partnerships.

Following existing partnerships were identified during planning process:

1	*Institute of Environmental Physics, University of Bremen,* www.iup.uni-bremen.de	Germany
2	*Max Planck Institute of Quantum Optics, Munich,* www.mpq.mpg.de/~haensch/	Germany
3	*Laboratory for Atmospheric and Climate Science, CSIC-JCCM, Toledo,* www.ciac.jccm-csic.es/	Spain
4	*Geo Forschungs Zentrum Potsdam,* www.gfz-potsdam.de	Germany
5	The Finnish Geodetic *Institute,* www.fgi.fi/i	Finland
6	*Lund Laser Centre, Lund University, http://www-llc.fysik.lth.se/*	Sweden
7	Laser Research Centre, Vilnius University, (VU LRC) *http://www.lasercenter.vu.lt/*	Lithuania
8	*University of Kaiserslautern ,*www.physik.uni-kl.de/bergmann/	Germany
9	*Institute of Biomedical Engineering, Linköping University,* *http://www.imt.liu.se/index.en.html*	Sweden
10	*Institute for Low Temperature Plasma Physics* at *Ernst Moritz Arndt University* in *Greifswald, www.uni-greifswald.de/*	Germany

Inventory case by case:

	Strategic partner	Country	Secondment days
1	*Institute of Environmental Physics, University of Bremen,* www.iup.uni-bremen.de	Germany	0

No secondments visits were used up to now. The FOTONIKA-LV team was successful getting the project "**FP7-PEOPLES- IRSES, Grant Nr. 294949, NOCTURNAL ATMOSPHERE, Secondary photochemical reactions and technologies for active remote sensing of nocturnal atmosphere"** retained for financing.

	Strategic partner	Country	Secondment days
2	*Max Planck Institute of Quantum Optics, Munich,* www.mpq.mpg.de/~haensch/	Germany	0

Dr. Janis Alnis before being recruited by this FP7 REGPOT grant nr. **285912** in the spring this year ensured close contacts. Dr.Atis Skudra and MsC Janis Blahis paid visits to MPI QO during the previous period using other resources.

	Strategic partner	Country	Secondment days
3	*Laboratory for Atmospheric and Climate Science, CSIC-JCCM, Toledo,* www.ciac.jccm-csic.es/	Spain	0

The contacts were sustained with colleagues in Spain. Due to crises they faced restructuring and therefore were pressed to reduce intensity in research. Dr. Arnolds Ubelis the coordinator of FP7 REGPOT grant nr. **285912** visited colleagues in Spain in December 2012. In planning meeting with colleagues plans for more intensive cooperation were moved to the second part of the project.

	Strategic partner	Country	Secondment days
4	*Geo Forschungs Zentrum Potsdam,* www.gfz-potsdam.de	Germany	71 outgoing

				55 incoming		
	Seconded person	Home institution	Hosting organisation	Secondment duration	days	WP
30.	Kalvis Salmiņš	Institute of Astronomy, Association FOTONIKA-LV, University of Latvia	GFZ Helmholtz Centre Potsdam,	21.11.2012. – 05.12.2012	15	1.1.
39	Kalvis Salmiņš	Institute of Astronomy, Association FOTONIKA-LV, University of Latvia	GFZ Helmholtz Centre Potsdam,	13.03.2013. – 27.03.2013.	15	1.1
57	Evan Hoffman	German Research Centre for Geosciences Potsdam, Germany	University of Latvia, Institute of Astronomy	19.08.2013. – 30.08.2013.	12	1.1
70	SALMIŅŠ KALVIS	Institute of Astronomy, Association FOTONIKA-LV, University of Latvia	GFZ Helmholtz Centre Potsdam,	18.10.2013. – 01.11.2013.	14	1.1
75	SALMIŅŠ KALVIS	Institute of Astronomy, Association FOTONIKA-LV, University of Latvia	GFZ Helmholtz Centre Potsdam,	12.02.2014. – 28.02.2014	17	1.1
77	Hoffman Evan Derek	German Research Centre for Geosciences Potsdam, Germany	University of Latvia, Institute of Astronomy	12.03.2014.- 22.03.2014	11	1.1.
88	EVAN DEREK HOFFMAN	German Research Centre for Geosciences Potsdam, Germany	University of Latvia, Institute of Astronomy	7.07.2014- 08.08.2014.	32	1.1.
96	SALMIŅŠ KALVIS	Institute of Astronomy, Association FOTONIKA-LV, University of Latvia	GFZ German Research Centre for Geosciences, Potsdamā	02.12.2014. – 11.12.2014.	10	1.1

Two secondment visits were used to sustain active cooperation. Besides, recruited Jorge del Pino visited GFZ Helmholtz Centre Potsdam, in June 2013 using other sours of funding. Visits from GFZ Helmholtz Centre Potsdam, to Riga are planned in the second part of Year 2013.

	Strategic partner	**Country**	**Secondment days**
5	The Finnish Geodetic *Institute,* www.fgi.fi/i	Finland	0

Active cooperation is on place including technical assistance to finish colleagues from Latvian side to redesign their SLR station made in Latvia. .Dr. Arnolds Ubelis the coordinator of FP7 REGPOT grant nr. **285912 paid duty trip visit to** colleagues in the Finnish Geodetic *Institute* and met with researchers' team of dr. Markku Poutanen in planning workshop and site visits to SLR station in Metsohovi. 2-3 secondment visits to Riga are foreseen starting from September 2013.

	Strategic partner		**Country**	**Secondment days**		
	Lund Laser Centre, Lund University, http://www-llc.fysik.lth.se/		Sweden	51 days = 1 month 23 days		
	Gothenburg University Physics Department		Sweden	354 days = 12 months 18 days		
	Seconded person	Home institution	Hosting organisation	Secondment duration	days	WP
1.	Dag Hanstorp	University of Gothenburg, Department of Physics	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry; The Institute of Atomic Physics and Spectroscopy;	02.02.2012.- 04.02.2012	3	1.1.
2	Zhongshan Li (Zviedrija)	Lund university, Faculty of engineering, Division of Combustion Physics	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy	02.04.- 04.04.2012	4	1.1.

7	Jānis Blahins	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	24.06.2012. - 16.07.2012. un 29.07.2012 - 26.08.2012.	55	1.1.
8	Kļaviņš Jānis	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, LU	Gothenburg University Physics Department	01.07.2012. – 28.07.2012	28	1.1.
9	Aigars Apsītis	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, LU	Gothenburg University Physics Department	09.07.2012. – 23.08.2012.	46	1.1.
12	Stefan Andersson-Engels	Lund University	Rīga	22.08.2012. – 24.08.2012.	3	1.1.
13	Katarina Svanberg	Lund University Hospital, Division of Oncology	Rīga	22.08.2012. – 24.08.2012	3	1.1.
15	Dag Hanstorp	University of Gothenburg, Department of PhysicsRīga	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry; The Institute of Atomic Physics and Spectroscopy;	22.08.2012. – 28.08.2012.	7	1.1.
16	Sune Roland Svanberg	Lund University Hospital, Division of Oncology, zinātnieks Sune Roland Svanberg,	Rīga	22.08.2012. – 26.08.2012.	5	1.1.
24	Aigars Apsītis	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, LU	Gothenburg University Physics Department	28.10.2012. – 12.11.2012	16	1.1.
25	Jānis Spīgulis	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, LU	Lund Laser Centre, Lund University, Sweden.	15.10.2012. - 09.11.2012.	26	1.1.
27	Jānis Blahins	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, LU	Gothenburg University Physics Department	28.10.2012. – 12.11.2012.	16	1.1.
32	Aigars Apsītis	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, LU	Gothenburg University Physics Department	12.01.2013. – 21.01.2013.	10	1.1.

33	Janis Blahins	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, LU	Gothenburg University Physics Department	12.01.2013. – 21.01.2013.	10	1.1
34	Aigars Rieba	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, LU	Gothenburg University Physics Department	12.01.2013. – 21.01.2013.	10	1.1.
35	Aigars Apsītis	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, LU	Gothenburg University Physics Department	09.03.2013. – 25.03.2013	17	1.1.
36	Aigars Rieba	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, LU	Gothenburg University Physics Department	09.03.2013. – 25.03.2013	17	1.1.
37	Janis Blahins	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, LU	Gothenburg University Physics Department	09.03.2013. – 25.03.2013.	17	1.1.
43	Aigars Rieba	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, LU	Gothenburg University Physics Department	04.05.2013. – 20.05.2013	17	1.1
46	Aigars Apsītis	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, LU	Gothenburg University Physics Department	07.06.2013. – 22.06.2013	16	1.1.
47	Janis Blahins	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, LU	Gothenburg University Physics Department	07.06.2013. – 22.06.2013	16	1.1.
55	Aigars Rieba	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Zviedrijā, Gēteborgas Universitātes	04.08.2013. – 17.08.2013	14	1.1
56	Janis Blahins	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	04.08.2013. – 17.08.2013	14	1.1
58	Andersson-Engels Stefan	Lund University	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	25.08.2013. – 31.08.2013.	7	1.1

59	Svanberg Sune Roland	Lund University Hospital, Division of Oncology	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	28.08.2013. – 30.08.2013.	3	1.1
72	RIEBA Aigars	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	20.11.2013. – 05.12.2013.	16	1.1.
83	Apsītis Aigars	The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	20.05.2014-26.05.2014	7	1.1
86	Svanberg Sune Roland Svanberg	Lund University Hospital, Division of Oncology	University of Latvia, Fotonika LV,	24.04.2014.-25.04.2014	2	1.1

Intensive cooperation was started with Lund Laser Centre in 1990, when dr.Uldis Bersinsch like young researchers performed his first research training visit in the labs of prof. Sune Svanberg, Actually the researchers teams in atomic physics, laser spectroscopy and in ion physics in Lund University Gothenburg University Physics Department Gothenburg University Physics Department are in close cooperation and when dr.hab Uldis Bersinsch was repatriated via FP7 REGPOT grant nr. 285912 the opportunity was captured to built unique mobile ion beam instrument GRIBA Listed above very intensive secondment visits contributed to the design the instrument which will serve for the multinational consortium formed by research centers in EU, Russia, USA and Mexixo. This consortium led by Dr.Uldis Berzinsch raised a project proposal: Dr.h.Uldis Berziņš, Coordinator spectroscopy of Ions Using Lasers and Synchrotron Radiation – a Global Scale Community, IONS SPECTRA, FP7-PEOPLES-IRSES-2013, and Nr 612582.

	Strategic partner		**Country**	**Secondment days**		
7	Laser Research Centre, Vilnius University, (VU LRC) http://www.lasercenter.vu.lt/		Lithuania	76 = 2 month 20 days		
	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
5	Edgars Saks	Institute of Atomic Physics and Spectroscopy, University of Latvia	Vilnius University Laser Research Centre	03.06.2012. - 30.06.2012	28	1.1.
61	Rotomskis Ričardas	Vilnius University, Laser Research	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	25.08.2013. – 31.08.2013.	7	1.1
64	Bagdonas Saulius	Vilnius University Physics Faculty, Department of Quantum Electronics	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	25.08.2013. – 31.08.2013.	7	1.1.
79	Parseliunas Eimuntas	Vilnius Gediminas University Faculty of Environmental Engineering,	University of Latvia, Institute of Geodesy and Geoinformatics	10.04.2014.-07.05.2014.	28	1.1
84	Ričardas Rotomskis	Vilnius University, Laser Research Center	Biophotonics Laboratory, Institute of Atomic Physics and Spectroscopy	25.04.2014-30.04.2014	6	1.1

Intensive collaboration is sustained via various visits financed by another projects and one secondment visit performed.

	Strategic partner		**Country**	**Secondment days**		
8	*University of Kaiserslautern* ,www.physik.uni-kl.de/bergmann/		Germany	55 days =1 month 27 days		
	Seconded person	**Home institution**	**Hosting organization**	**Secondment duration**	**days**	**WP**

20	Klass Bergmann	Technische Universitaet Kaiserslautern, Fachbereich Physik	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia	26.08.2012. – 31.08.2012.	6	1.1.
54	Bergmann Klaas	Technische Universitaet Kaiserslautern, Fachbereich Physik	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia	20.08.2013. – 30.08.2013.	11	1.1
69	Bergmann Klaas	Technische Universitaet Kaiserslautern, Fachbereich Physik	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV,	29.10.2013. - 30.11.2013.	33	1.1
73	Bergmann Klaas	Technische Universitaet Kaiserslautern, Fachbereich Physik	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia	21-25.01.2014	5	1.1

Intensive collaboration is sustained via various visits financed by another projects and one secondment visit performed.

	Strategic partner	**Country**	**Secondment days**
9	*Institute of Biomedical Engineering, Linköping University*, http://www.imt.liu.se/index.en.html	Sweden	48 days = 1 month 20 days

	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
29	Dainis Jakovels	Association FOTONIKA-LV, University of Latvia, Institute of Atomic Physics and Spectroscopy	Linkoping University, Department of Biomedical Engineering	07.11.2012. - 04.12.2012	28	1.1.
40	Salerund Eric Goran	Linköping University Department of Biomedical Engineering	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	09.04.2013. – 12.04.2013	4	1.1
63	Goran Salerud Eric	Linköping University Department of Biomedical Engineering	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	25.08.2013. – 01.09.2013.	8	1.1.
66	Wing Cheung Mak	Linköping University	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	24.08.2013. – 31.08.2013.	8	1.1.

Intensive collaboration is sustained via various visits financed by another projects (e.g. Dr.Arnolds Ubelis (Coordinator FP7-PEOPLES-IRSES ***BIOSENSORS-AGRICULT.*** *Nr.**316177*** – ***"DEVELOPMENT OF NANOTECHNOLOGY BASED BIOSENSORS FOR AGRICULTURE"***, and two secondment visits performed.

	Strategic partner	**Country**	**Secondment days**
10	*Institute for Low Temperature Plasma Physics* at *Ernst Moritz Arndt University* in *Greifswald*, www.uni-greifswald.de/	Germany	0

Collaboration is sustained via visits financed by another sources.

3. Two-way secondments between the FOTONIKA research community at the University and marked or emerging partnerships in the EU and beyond

As mentioned before, Ttotally in project during period 01.02.1012.-31.01.2015.was spent almost 57.1 person months of secondment visits, from which 25 month and 19 days was secondments with strategic partners and **31 month and 11 days was secondments with emerging and new partnerships.**

Following emerging partnerships were identified during planning process;

1	**Institute of Theoretical Physics and Astronomy, Vilnius University** (*G. Tautvaisiene, Z. Rudzikas*) - intensification of cooperation;	Lithuania
2	**Max Planck Institut für Chemie, Mainz** (*T.Wagner*) - intensification of cooperation	Germany
3	**The Fraunhofer Institute for Systems and Innovation Research ISI** (*ISI http://www.isi.fraunhofer.de/*), Karlsruhe *(Univ-Prof. Dr. Marion A. Weissenberger Eibl)* – development of new cooperation for new leaders training in science management and applications [1]	Germany
4	**Space Research Center** Polish Academy of Science	Poland
5	**International laser Center** *Lomonosov Moscow State University,*	Russia
6	*University of Oulu, **Optoelectronics and Measurement Techniques Laboratory**; http://www.ee.oulu.fi/research/oemlab/index_eng.html*	Sweden
7	Institute of Semiconductor Physics, Novosibirsk, Russia, *www.isp.nsc.ru*	Russia
8	Laboratoire Aime Cotton, CNRS, Orsay, France, *www.lac.u-psud.fr/*	France
9	Fock Institute of Physics, St. Petersburg State University, Russia, *www.niif.spbu.ru/*	Russia
10	Department of Phyiscs, Heidelberg University, Heidelberg, Germany., www.physik.uni-**heidelberg**.de	Germany
11	**FP6 ERA-NET project network ASTRONET**	EU

Secondment visits inventory case by case.

	Emerging partnerships	Country	Secondment days
1	**Institute of Theoretical Physics and Astronomy**, Vilnius University (*G. Tautvaisiene, Z. Rudzikas*) - intensification of cooperation;	Lithuania	92 day = 3 month 8 days
	Institute of Oncology, Laboratory of Biomedical physics, Vilnius University		5 days
	Laser Research Center, Biophotonics group, Vilnius University		31 day

	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
4	Ilgmārs Eglītis	Astronomy observatory, Institute of Astronomy	Moletai Observatory Institute of Theoretical Physics and Astronomy Vilnius University, Lithuania	14.05.2012. – 13.06.2012	31	1.2.
21	Vitalijus Karabanovas	Vilnius University Institute of Oncology, Laboratory of Biomedical physics	Laboratory of Biophotonics, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV	27.08.2012. – 31.08.2012.	5	1.2.
41	Aleksejs Ļihačovs	Laboratory of Biophotonics, The Institute of Atomic Physics and	Laser Research Center, Biophotonics group, Vilnius University,	01.05.2013. - 31.05.2013	31	1.2.

[1] *Fraunhofer is Europe's largest application-oriented research organization. Our research efforts are geared entirely to people's needs: health, security, communication, energy and the environment. As a result, the work undertaken by our researchers and developers has a significant impact on people's lives. We are creative. We shape technology. We design products. We improve methods and techniques. We open up new vistas. In short, we forge the future.www.Fraunhofer.de,*

		Spectroscopy, Association FOTONIKA-LV, University of Latvia				
51	Ilgmars Eglitis	Astronomy observatory, Institute of Astronomy, Association FOTONIKA-LV, University of Latvia	Moletai Observatory Institute of Theoretical Physics and Astronomy Vilnius University,	14.06.2013. – 07.07.2013.	24	1.2.
92	Ilgmārs Eglītis	University of Latvia, Institute of Astronomy	Moletai Observatory Institute of Theoretical Physics and Astronomy Vilnius University,	03.10.2014.- 08.11.2014	37	1.2.

	Emerging partnerships	Country	Secondment days
2	**Max Planck Institut für Chemie,** Mainz (T.Wagner) - intensification of cooperation	Germany	0

Cooperation is sustained by the project: "Dr.Arnolds Ubelis, Coordinator**. FP7-PEOPLES- IRSES, Grant Nr. 294949, "NOCTURNAL ATMOSPHERE, Secondary photochemical reactions and technologies for active remote sensing of nocturnal atmosphere".**

	Emerging partnerships	Country	Secondment days
3	**The Fraunhofer Institute for Systems and Innovation Research ISI** (*ISI http://www.isi.fraunhofer.de/*), Karlsruhe *(Univ-Prof. Dr. Marion A. Weissenberger Eibl)* – development of new cooperation for new leaders training in science management and applications [2]	Germany	84 Days= 3 month

	Seconded person	**Home institution**	**Hosting organization**	**Secondment duration**	**days**	**WP**
26	Inese Jaunpaule	Institute of Geodesy and Geoinformatics	Karlsruhe University of Applied Sciences, Institute of Geomatics un Fraunhofer Institute for Systems and Innovation Research ISI	20.10.2012. - 20.12.2012.	62	1.2.
42	Kerstin Cuhls	Fraunhofer Institute for Systems and Innovation Research, Germany	Association FOTONIKA-LV, Latvian Univerity	02.05.2013. - 04.05.2013.	3	1.2.
81	Sandra Šmaliņa	University of Latvia, Fotonika LV	The Fraunhofer Institute for Systems and Innovation Research,	04.05.2014.- 22.05.2014.	19	1.1

	Emerging partnerships	Country	Secondment days
4	**Space Research Center** Polish Academy of Science	Poland	2 days
	Institute of Physics of the Polish Academy of Sciences	Poland	8 days

	Seconded person	**Home institution**	**Hosting organization**	**Secondment duration**	**days**	**WP**
49	GLODZ Malgorzata Anna	Institute of Physics of the Polish Academy of Sciences	University of Latvia, Fotonika LV	18.06.2013. – 25.06.2013.	8	1.2.
	Marek Banaszkiewicz	Space Research Centre	University of Latvia, Fotonika LV	05.06.2014.- 06.06.2014.	2	1.2

	Emerging partnerships	Country	Secondment days
5	**International laser Center** *Lomonosov Moscow State University,*	Russia	50 days =1 month 22 days

[2] *Fraunhofer is Europe's largest application-oriented research organization. Our research efforts are geared entirely to people's needs: health, security, communication, energy and the environment. As a result, the work undertaken by our researchers and developers has a significant impact on people's lives. We are creative. We shape technology. We design products. We improve methods and techniques. We open up new vistas. In short, we forge the future.www.Fraunhofer.de,*

	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
11	Alexander V. Priezzhev	Moskow Lomonosow State Univerity	Laboratory of Biophotonics, The Institute of Atomic Physics and Spectroscopy,	07.08.2012. – 29.08.2012.	23	1.2.
22	Jānis Spigulis	Laboratory of Biophotonics, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	International Laser Centre, Moscow Lomonosov State University;	10.09.2012. - 15.09.2012. un 24.09.2012 - 05.10.2012	18	1.2.
65	Alexander V.Priezzhev	Moskow, Lomonosov State University	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	25.08.2013. – 02.09.2013.	9	1.2.

	Emerging partnerships	Country	Secondment days
6	**University of Oulu,** Optoelectronics and Measurement Techniques Laboratory; http://www.ee.oulu.fi/research/oemlab/index_eng.html	Sweden	31 days

	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
10	Edgars Kviesis-Kipge	Biophotonics Laboratory, Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV	University of Oulu, Optoelectronics And Measurement Techniques Laboratory.	30.07.2012. – 25.08.2012	31	1.2.
14	Matti Kinnunen	University of Oulu	Biophotonics Laboratory, Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV	22.08.2012. – 24.08.2012.	3	1.2.
18	Anssi Jaakko Makynen	Oulu, Department of Electrical Engineering,	Biophotonics Laboratory, Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV	23.08.2012. – 24.08.2012.	2	1.1.

	Emerging partnerships	Country	Secondment days
7	Institute of Semiconductor Physics, Novosibirsk, Russia, *www.isp.nsc.ru*	Russia	0

Collaboration is sustained via visits financed by another sources.

	Emerging partnerships	Country	Secondment days
8	Laboratoire Aime Cotton, CNRS, Orsay, France, *www.lac.u-psud.fr/*	France	0

There is only virtual collaboration between two teams in the field of theoretical atomic physics.

	Emerging partnerships	Country	Secondment days
9	St. Petersburg State University, Russia, *www.niif.spbu.ru/*	Russia	41 days

	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
6	Aleksandrs Svarcs	Association FOTONIKA-LV,	St.Petersburge State University, Physical faculty, Department of Optics and Spectroscopy	16.06.2012. – 29.06.2012.	11	1.2.

31	Kaspars Miculis	University of Latvia, Faculty of Physics and Mathematics, Laser Centre	St. Petersburg State University, Faculty of Physics,	07.12.2012. - 21.12.2012.	15	1.2.
52	Svarcs Aleksandrs	Association FOTONIKA-LV,	St.Petersburg State University, Physical faculty, Department of Optics and Spectroscopy	11.06.2013. – 25.06.2013.	15	1.2.
82	Kaspars Mičulis	University of Latvia, Faculty of Physics and Mathematics, Laser Centre	St. Petersburg State University, Faculty of Physics,	21.04.2014.- 20.05.2014.	30	1.2
94	BEZUGLOV NIKOLAY	St.Petersburge State University	University of Latvia, The Institute of Atomic Physics and Spectroscopy	27.10.2014. – 31.10.2014.	5	1.2

	Emergign partnerships	Country	Secondment days
10	Department of Physics, Heidelberg University, Heidelberg, Germany., *www.physik.uni-heidelberg.de*	Germany	0

Cooperation is sustained via activities of dr. Janis Pukite originated from the university of Latvia in particular from the group of dr.Arnolds Ubelis.

	Emerging partnerships	Country	Secondment days
11	**FP6 ERA-NET project network ASTRONET**	EU	0

The Institute of Astronomy of FOTONIKA-LV is a member of this network.

	NEW partnerships			Country	Secondment days	
12	National Institute for Theoretical Physics,			South Africa	183 days	
	Seconded person	**Home institution**	**Hosting organization**	**Secondment duration**	**days**	**WP**
3	Teodora Kirova	National Institute for Theoretical Physics, South Africa	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy; Association FOTONIKA-LV, University of Latvia	10.04.2012. – 09.10.2012. 10.10.2012.- 10.11.2012.	183	1.2.

	New partnerships			Country	Secondment days	
13	Austrian Institute of Technology			Austria	22 days	
	Seconded person	**Home institution**	**Hosting organization**	**Secondment duration**	**days**	**WP**
23	Arnolds Ubelis	Association FOTONIKA-LV, University of Latvia	Austrian Institute of Technology,	24.09.2012. - 01.10.2012.	8	1.2.
67	Sandra Šmaliņa	Association FOTONIKA-LV, University of Latvia	Austrian Institute of technology, Viena, Austria	08.09.2013.- 14.09.2013.	7	1.2
68	Ojārs Balcers	Association FOTONIKA-LV, University of Latvia	Austrian Institute of technology, Viena, Austria	08.09.2013.- 14.09.2013.	7	1.2

	New partnerships			Country	Secondment days	
14	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE European Institutes of Membranes, Montpellier, France			France	8 days	
	Seconded person	**Home institution**	**Hosting organization**	**Secondment duration**	**days**	**WP**
28	Roman Viter	ODESSA NATIONAL I.I. MECHNIKOV UNIVERSITY, Odessa, Ukraine	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE European Institutes of Membranes,	03.11.2012. - 10.11.2012.	8	1.2.

			Montpellier, France			

	New partnerships		Country	Secondment days		
15	Ultracold Atom Laboratory, National Tsing Hua University, Department of Physics Hsinchu,		Taiwan	23 days		
	Seconded person	**Home institution**	**Hosting organization**	**Secondment duration**	**days**	**WP**
38	Yi-Hsin Chen	Ultracold Atom Laboratory, National Tsing Hua University, Department of Physics Hsinchu, Taiwan,	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia	02.03.2013 - 18.03.2013 and 25.03.2013 - 30.03.2013	23	1.2.

	New partnerships		Country	Secondment days		
16	Institute of Electronics, Bulgarian Academy of Sciences		Bulgaria	15 days		
	Seconded person	**Home institution**	**Hosting organization**	**Secondment duration**	**days**	**WP**
44	Miculis Kaspars	University of Latvia, Faculty of Physics and Mathematics, Laser Centre	Institute of Electronics, Bulgarian Academy of Sciences	16.05.2013. - 30.05.2013.	15	1.2.

	New partnerships		Country	Secondment days		
17	Aalborg University The Faculty of Engineering and Science Department of Development and Planning, Danish GPS Center,		Denmark	34 days		
	Seconded person	**Home institution**	**Hosting organization**	**Secondment duration**	**days**	**WP**
45	Janis Zvirgzds	Institute of Geodesy and Geoinformatics, Association FOTONIKA-LV, University of Latvia	Aalborg University The Faculty of Engineering and Science Department of Development and Planning, Danish GPS Center	13.05.2013. - 15.06.2013	34	1.2.

	New partnerships		Country	Secondment days		
18	Stony Brook University, Department of Physics		USA	7 days		
	Seconded person	**Home institution**	**Hosting organization**	**Secondment duration**	**days**	**WP**
48	Harold Joseph Metcalf	Stony Brook University, Dept. of Physics	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	16.06.2013. – 22.06.2013	7	1.2.

	New partnerships		Country	Secondment days		
19	Swiss Federal Institute of Technology Zurich		Switzerland	19 days		
	Seconded person	**Home institution**	**Hosting organization**	**Secondment duration**	**days**	**WP**
50	Jānis Alnis	Association FOTONIKA-LV Institute of Atomic Physics and Spectroscopy, University of Latvia	Swiss Federal Institute of Technology Zurich (ETH Zurich) ETH Institute for Particle Physics (IPP) Laboratory of Positron and Positronium Physics,	24.06.2013. - 12.07.2013	19	1.2.

	New partnerships	Country	Secondment days
20	European Photonics Industry Consortium – EPIC Association	Belgium	3 days

	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
53	Dr. Geokso-Carlos Lee	European Photonics Industry Consortium	Association Fotonika LV, University of Latvia	25.07.2013. – 27.07.2013.	3	1.2.

	New partnerships	Country	Secondment days
21	Stockholm University, Physics Department,	Sweden	8 days

	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
19	Henrik Cederquist	Stockholm University, Physics Department, DESIREE	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia	24.08.2012. – 28.08.2012.	5	1.1.
74	Stockett Mark Hugo	Stockholm University, Department of Physics	Univerity of Latvia, FOTONIAK LV	06.02.2014.- 08.02.2014.	3	1.1

	New partnerships	Country	Secondment days
22	Oak Ridge National Laboratory (USA)	USA	8 days

	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
17	David Pegg (USA)	Oak Ridge National Laboratory (USA)	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, University of Latvia	22.08.2012. – 30.08.2012.	8	1.2.

	New partnerships	Country	Secondment days
23	Gdansk University of Technology, Faculty of Applied Physics and Mathematics, Gdansk Poland	Poland	9 days

	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
60	BALCERS OJĀRS	Association FOTONIKA-LV, University of Latvia	Gdansk University of Technology, Faculty of Applied Physics and Mathematics, Gdansk Poland	03.08.2013. - 11.08.2013.	9	1.2

	New partnerships	Country	Secondment days
24	National University of Life and Environmental Sciences of Ukraine	Ukraine	10

	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
62	Starodub Mykola	National University of Life and Environmental Sciences of Ukraine	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	24.08.2013. – 02.09.2013	10	1.2

	New partnerships	Country	Secondment days
25	Université de Fribourg, Département de physique	Switzerland	14days

	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
71	Fescenko Ilja	Université de Fribourg, Département de physique	University of Latvia, FOTONIKA LV	19.11.2013. – 02.12.2013	14	1.2.

	New partnerships	Country	Secondment days
26	Univerity of Piza	France	21 days

	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
76	BEZUGLOV NIKOLAY	University of Latvia, Fotonika LV	France, University of Piza	31.01.2014. - 09.02.2014.	10	1.2
99	BEZUGLOV NIKOLAY	University of Latvia, The Institute of Atomic Physics and Spectroscopy;	France, University of Piza	20.01.2015. – 30.01.2015.	11	1.2

	New partnerships	Country	Secondment days
27	Aeonyx Research Corporation, Aeonyx Photonics Division	Switzerland	7 days

	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
78	Svilans Mikelis	Aeonyx Research Corporation, Aeonyx Photonics Division	University of Latvia, Fotonika LV	07.04.2014. – 13.04.2014.	7	1.2

	New partnerships	Country	Secondment days
28	Physical Research Laboratory, Space and Atmospheric Science division, (INDIA)	INDIA	28 days

	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
80	Arvind Kumar Saxena	Physical Research Laboratory, Space and Atmospheric Science division, (INDIA)	University of Latvia, The Institute of Atomic Physics and Spectroscopy;	12.04.2014.- 22.04.2014	11	1.2.
89	Arvind Kumar Saxena	Physical Research Laboratory, Space and Atmospheric Science division, (INDIA)	University of Latvia, The Institute of Atomic Physics and Spectroscopy;	04.08.2014.- 10.08.2014.	7	1.2
90	Arvind Kumar Saxena	Physical Research Laboratory, Space and Atmospheric Science division, (INDIA)	University of Latvia, The Institute of Atomic Physics and Spectroscopy;	11.08.2014.- 20.08.2014.	10	1.2

	New partnerships	Country	Secondment days
29	National Tsing Hua University, Taiwan	TAIWAN	21 days

	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
85	Lee Meng Jung	National Tsing Hua University, Taiwan	University of Latvia, The Institute of Atomic Physics and Spectroscopy	01.05.2014- 21.05.2014	21	1.2

	New partnerships	Country	Secondment days
30	Amsterdam University, Korteveg - de Vries institute of mathematics	Netherlands	11 days

	Seconded person	Home institution	Hosting organization	Secondment duration	days	WP
87	KOROVIN JEGOR	Amsterdam University, Korteveg - de Vries institute of mathematics	University of Latvia, The Institute of Atomic Physics and Spectroscopy	27.05.2014.- 06.06.2014.	11	1.2

	New partnerships	Country	Secondment days

30	Karlsruhe University of Applied Sciences (HSKA) Faculty of Information Management and Media			Germany	6	
	Seconded person	**Home institution**	**Hosting organization**	**Secondment duration**	**days**	**WP**
93	Reiner Rudolf Jager	Karlsruhe University of Applied Sciences (HSKA) Faculty of Information Management and Media	University of Latvia, Institute of Geodesy and Geoinformatics	10.10.2014.-15.10.2014.	6	1.2

	New partnerships			**Country**	**Secondment days**	
32	Turkish Scientific and Technological Research Council, Marmara Research Centre, Lasers and Laser Technologies Laboratory			Turkey	6	
	Seconded person	**Home institution**	**Hosting organization**	**Secondment duration**	**days**	**WP**
95	Kerim Allahverdi	Turkish Scientific and Technological Research Council, Marmara Research Centre, Lasers and Laser Technologies Laboratory	Institute of Astronomy, Association FOTONIKA-LV, University of Latvia	09.12.2014. – 14.12.2014.	6	1.2

	New partnerships			**Country**	**Secondment days**	
33	Indian Institute of Teacher Education			INDIA	14	
	Seconded person	**Home institution**	**Hosting organization**	**Secondment duration**	**days**	**WP**
97	SARMAH PATHAK JUMISREE	Indian Institute of Teacher Education (Gandhinagar, Gwarat, India), Centre of Education, Department of Physic	University of Latvia, The Institute of Atomic Physics and Spectroscopy	21.12.2014. – 03.01.2015.	14	1.2

	New partnerships			**Country**	**Secondment days**	
34	Vienna University, Institute of Meteorology and Geophysics			Austria	21	
	Seconded person	**Home institution**	**Hosting organization**	**Secondment duration**	**days**	**WP**
98	Diana Haritonova	University of Latvia, Institute of Geodesy and Geoinformatics	Vienna University, Institute of Meteorology and Geophysics	11.01.2015. – 31.01.2015.	21	1.2

Conclusions

During the project (01.02.2012-31.01.2015) were performed 98 secondment visits. Totally was spent almost 57.1 person months of secondment visits, from which 25 month and 19 days was secondments with strategic partners and 31 month and 11 days was secondments with emerging and new partnerships.
Secondment visits by project periods and divided by incoming and outgoing visits are shown in table below.

Table.1. Secondment visits project FOTONIKA LV period 01.02.2012.-31.01.2015.

	Total	Existing Partnerships WP1.1		Emerging partnerships WP 1.2.	
		Incoming	Outgoing	Incoming	Outgoing
1st period numb. of visits	53	11	18	9	15
Person month	36,9	1,79	13,4	9,21	12,5
2nd period number of visits	44	16	7	14	7
Person month	19,7	6,5	3,5	4,7	5
TOTAL in PROJECT					
VISITS	96	27	25	22	22
Person month	56,6	8,29	16,9	13,91	17,5

The performed secondment visits substantially increasing “critical masses” of intellectual capacity for the defined scientific tasks provided a lot of synergy resulting in increased scientific productivity.
In the tabele 2 and table 3 are compiled institution with whom secomdment visits were performed.

Annexes

Annex 1: List of secondments

	Seconded person	Home institution	Hosting organization	Secondment duration	Number of days	WP
1	Dag Hanstorp	University of Gothenburg, Department of Physics	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry; The Institute of Atomic Physics and Spectroscopy;	02.02.2012.-04.02.2012	3	1.1.
2	Zhongshan Li (Zviedrija)	Lund university, Faculty of engineering, Division of Combustion Physics	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry The Institute of Atomic Physics and Spectroscopy	02.04.2012-04.04.2012	4	1.1.
3	Teodora Kirova	National Institute for Theoretical Physics, South Africa	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy; Association FOTONIKA-LV, University of Latvia	10.04.2012. – 09.10.2012. 10.10.2012.-10.11.2012.	183	1.2.
4	Ilgmārs Eglītis	Astronomy observatory, Institute of Astronomy	Moletai Observatory Institute of Theoretical Physics and Astronomy Vilnius University, Lithuania	14.05.2012. – 13.06.2012	31	1.2.
5	Edgars Saks	Institute of Atomic Physics and Spectroscopy, University of Latvia	Vilnius University Laser Research Centre	03.06.2012. - 30.06.2012	28	1.2.
6	Aleksandrs Švarcs	Association FOTONIKA-LV,	St. Petersburg State University, Physical faculty, Department of Optics and Spectroscopy	16.06.2012. – 29.06.2012.	11	1.2.
7	Jānis Blahins	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	24.06.2012. - 16.07.2012. un 29.07.2012 - 26.08.2012.	55	1.1.
8	Kļaviņš Jānis	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	01.07.2012. – 28.07.2012	28	1.1.
9	Aigars Apsītis	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	09.07.2012. – 23.08.2012.	46	1.1.

	Seconded person	Home institution	Hosting organization	Secondment duration	Number of days	WP
10	Edgars Kviesis-Kipge	Biophotonics Laboratory, Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV	University of Oulu, Optoelectronics And Measurement Techniques Laboratory.	30.07.2012. – 25.08.2012	31	1.2.
11	Alexander V. Priezzhev	Moskow Lomonosow State Univerity	Laboratory of Biophotonics, The Institute of Atomic Physics and Spectroscopy,	07.08.2012. – 29.08.2012.	23	1.2.
12	Stefan Andersson-Engels	Lund University	Biophotonics Laboratory, Institute of Atomic Physics and Spectroscopy	22.08.2012. – 24.08.2012.	3	1.1.
13	Katarina Svanberg	Lund University Hospital, Division of Oncology	Biophotonics Laboratory, Institute of Atomic Physics and Spectroscopy	22.08.2012. – 24.08.2012	3	1.1.
14	Matti Kinnunen	University of Oulu	Biophotonics Laboratory, Institute of Atomic Physics and Spectroscopy	22.08.2012. – 24.08.2012.	3	1.2.
15	Dag Hanstorp	University of Gothenburg, Department of Physics Rīga	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry; The Institute of Atomic Physics and Spectroscopy;	22.08.2012. – 28.08.2012.	7	1.1.
16	Sune Roland Svanberg	Lund University Hospital, Division of Oncology, scientist Sune Roland Svanberg,	Biophotonics Laboratory, Institute of Atomic Physics and Spectroscopy	22.08.2012. – 26.08.2012.	5	1.1.
17	David Pegg (USA)	Oak Ridge National Laboratory (USA)	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, University of Latvia	22.08.2012. – 30.08.2012.	8	1.2.
18	Anssi Jaakko Makynen	Oulu, Department of Electrical Engineering,	Biophotonics Laboratory, Institute of Atomic Physics and Spectroscopy	23.08.2012. – 24.08.2012.	2	1.2.
19	Henrik Cederquist	Stockholm University, Physics Department, DESIREE	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia	24.08.2012. – 28.08.2012.	5	1.1.
20	Klass Bergmann	Technische Universitaet Kaiserslautern, Fachbereich Physik	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia	26.08.2012. – 31.08.2012.	6	1.1.
21	Vitalijus Karabanovas	Vilnius University Institute of Oncology, Laboratory of Biomedical physics	Rīga	27.08.2012. – 31.08.2012.	5	1.2.

	Seconded person	Home institution	Hosting organization	Secondment duration	Number of days	WP
22	Jānis Spigulis	Laboratory of Biophotonics, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	International Laser Centre, Moscow Lomonosov State University;	10.09.2012. - 15.09.2012. un 24.09.2012 - 05.10.2012	18	1.2.
23	Arnolds Ubelis	Association FOTONIKA-LV, University of Latvia	Austrian Institute of Technology,	24.09.2012. - 01.10.2012.	8	1.2.
24	Aigars Apsītis	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	28.10.2012. – 12.11.2012	16	1.1.
25	Jānis Spīgulis	Laboratory of Biophotonics, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Lund Laser Centre, Lund University, Sweden.	15.10.2012. - 09.11.2012.	26	1.1.
26	Inese Jaunpaule	Institute of Geodesy and Geoinformatics	Karlsruhe University of Applied Sciences, Institute of Geomatics un Fraunhofer Institute for Systems and Innovation Research ISI	20.10.2012. - 20.12.2012.	62	1.2.
27	Jānis Blahins	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	28.10.2012. – 12.11.2012.	16	1.1.
28	Roman Viter	Association FOTONIKA-LV, University of Latvia, Institute of Atomic Physics and Spectroscopy	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE European Institutes of Membranes, Montpellier, France	03.11.2012. - 10.11.2012.	8	1.2.
29	Dainis Jakovels	Association FOTONIKA-LV, University of Latvia, Institute of Atomic Physics and Spectroscopy	Linkoping University, Department of Biomedical Engineering	07.11.2012. - 04.12.2012	28	1.1.
30	Kalvis Salmiņš	Institute of Astronomy, Association FOTONIKA-LV, University of Latvia	GFZ Helmholtz Centre Potsdam,	21.11.2012. – 05.12.2012	15	1.1.
31	Kaspars Mičulis	University of Latvia, Faculty of Physics and Mathematics, Laser Centre	St. Petersburg State University, Faculty of Physics,	07.12.2012. - 21.12.2012.	15	1.2.
32	Aigars Apsītis	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	12.01.2013. – 21.01.2013.	10	1.1.
33	Janis Blahins	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	12.01.2013. – 21.01.2013.	10	1.1

	Seconded person	Home institution	Hosting organization	Secondment duration	Number of days	WP
34	Aigars Rieba	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	12.01.2013. – 21.01.2013.	10	1.1.
35	Aigars Apsītis	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	09.03.2013. – 25.03.2013	17	1.1.
36	Aigars Rieba	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	09.03.2013. – 25.03.2013	17	1.1.
37	Janis Blahins	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	09.03.2013. – 25.03.2013.	17	1.1.
38	Yi-Hsin Chen	Ultracold Atom Laboratory, National Tsing Hua University, Department of Physics Hsinchu, Taiwan,	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia	02.03.2013 - 18.03.2013 un 25.03.2013 - 30.03.2013	23	1.2.
39	Kalvis Salmiņš	Institute of Astronomy, Association FOTONIKA-LV, University of Latvia	GFZ Helmholtz Centre Potsdam,	13.03.2013. – 27.03.2013.	15	1.1
40	Salerund Eric Goran	Linköping University Department of Biomedical Engineering	Laboratory of Biophotonics, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	09.04.2013. – 12.04.2013	4	1.1.
41	Aleksejs Ļihačovs	Laboratory of Biophotonics, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Vilnius University, Laser Research Center, Biophotonics group	01.05.2013. - 31.05.2013	31	1.2.
42	Kerstin Cuhls	Fraunhofer Institute for Systems and Innovation Research, Germany	Fotonika LV, Latvian Univerity	02.05.2013. 04.05.2013.	3	1.2.
43	Aigars Rieba		Gothenburg University Physics Department	04.05.2013. – 20.05.2013	17	1.1
44	Mičulis Kaspars	University of Latvia, Faculty of Physics and Mathematics, Laser Centre	Institute of Electronics, Bulgarian Academy of Sciences	16.05.2013. - 30.05.2013.	15	1.2.
45	Jānis Zvirgzds	Institute of Geodesy and Geoinformatics, Association FOTONIKA-LV, University of Latvia	Aalborg University The Faculty of Engineering and Science Department of Development and Planning, Danish GPS	13.05.2013. - 15.06.2013	34	1.2.

	Seconded person	Home institution	Hosting organization	Secondment duration	Number of days	WP
			Center			
46	Aigars Apsītis	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	07.06.2013. – 22.06.2013	16	1.1.
47	Janis Blahins	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	07.06.2013. – 22.06.2013	16	1.1.
48	Harold Joseph Metcalf	Stony Brook University, Dept. of Physics	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	16.06.2013. – 22.06.2013	7	1.2.
49	GLODZ Malgorzata Anna	Institute of Physics of the Polish Academy of Sciences	Latvian University, Associations Fotonika LV	18.06.2013. – 25.06.2013.	8	1.2.
50	Jānis Alnis	Association FOTONIKA-LV Institute of Atomic Physics and Spectroscopy, University of Latvia	Swiss Federal Institute of Technology Zurich (ETH Zurich) ETH Institute for Particle Physics (IPP) Laboratory of Positron and Positronium Physics,	24.06.2013. - 12.07.2013	19	1.2.
51	Ilgmars Eglitis	Astronomy observatory, Institute of Astronomy, Association FOTONIKA-LV, University of Latvia	Moletai Observatory Institute of Theoretical Physics and Astronomy Vilnius University,	14.06.2013. – 07.07.2013.	24	1.2.
52	Švarcs Aleksandrs	Association FOTONIKA-LV,	St. Petersburg State University, Physical faculty, Department of Optics and Spectroscopy	11.06.2013. – 25.06.2013.	15	1.2.
53	Dr. Geokso-Carlos Lee	European Photonics Industry Consortium - EPIC association	Association Fotonika LV, University of Latvia	25.07.2013. – 27.07.2013	3	1.2.

2nd period seconndments (01.08.2013.- 31.01.2015)

	Seconded person	Home institution	Hosting organization	Secondment duration	Number of days	WP
54	Bergmann Klaas	Technische Universitaet Kaiserslautern, Fachbereich Physik	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia	20.08.2013. – 30.08.2013.	11	1,1
55	Aigars Rieba	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Zviedrijā, Gēteborgas Universitātes	04.08/.2013. – 17.08.2013	14	1.1

	Seconded person	Home institution	Hosting organization	Secondment duration	Number of days	WP
56	Janis Blahins	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	04.08/.2013. – 17.08.2013	14	1.1
57	Evan Hoffman	German Research Centre for Geosciences Potsdam, Germany	University of Latvia, Institute of Astronomy	19.08.2013. – 30.08.2013.	12	1.1
58	Andersson-Engels Stefan	Lund University	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	25.08.2013. – 31.08.2013.	7	1.1
59	Svanberg Sune Roland	Lund University Hospital, Division of Oncology	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	28.08.2013. – 30.08.2013.	3	1.1
60	BALCERS OJĀRS	Association FOTONIKA-LV, University of Latvia	Gdansk University of Technology, Faculty of Applied Physics and Mathematics, Gdansk Poland	03.08.2013. - 11.08.2013.	9	1.2
61	Rotomskis Ričardas	Vilnius University, Laser Research	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	25.08.2013. – 31.08.2013.	7	1.1
62	Starodub Mykola	National University of Life and Environmental Sciences of Ukraine	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	24.08.2013. – 02.09.2013	10	1.2
63	Goran Salerud Eric	Linköping University Department of Biomedical Engineering	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	25.08.2013. – 01.09.2013.	8	1.1.
64	Bagdonas Saulius	Vilnius University Physics Faculty, Department of Quantum Electronics	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	25.08.2013. – 31.08.2013.	7	1.1.
65	Alexander V.Priezzhev	Moskow, Lomonosov State University	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	25.08.2013. – 02.09.2013.	9	1.2.
66	Wing Cheung Mak	Linköping Univerity	University of Latvia, Fotonika LV, Conference Biofotonics 2013.	24.08.2013. – 31.08.2013.	8	1.1.
67	Sandra Šmaliņa	Association FOTONIKA-LV, University of Latvia	Austrian Institute of technology, Viena, Austria	08.09.2013.- 14.09.2013.	7	1.2
68	Ojārs Balcers	Association FOTONIKA-LV, University of Latvia	Austrian Institute of technology, Viena, Austria	08.09.2013.- 14.09.2013.	7	1.2
69	Bergmann Klaas	Technische Universitaet Kaiserslautern, Fachbereich Physik	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia	29.10.2013. - 30.11.2013.	33	1.1
70	SALMIŅŠ KALVIS	Institute of Astronomy, Association FOTONIKA-LV, University of Latvia	GFZ Helmholtz Centre Potsdam,	18.10.2013. – 01.11.2013.	14	1,1
71	Fescenko Ilja	Université de Fribourg, Département de physique	University of Latvia, FOTONIKA LV	19.11.2013. – 02.12.2013	14	1.2.
72	RIEBA Aigars	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy,	Gothenburg University Physics Department	20.11.2013. – 05.12.2013.	16	1.1.
73	Bergmann Klaas	Technische Universitaet Kaiserslautern, Fachbereich Physik	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy	21-25.01.2014	5	1.1

	Seconded person	Home institution	Hosting organization	Secondment duration	Number of days	WP
			Association FOTONIKA-LV, University of Latvia			
74	Stockett Mark Hugo	Stockholm University, Department of Physics	University of Latvia, FOTONIAK LV	06.02.2014.-08.02.2014.	3	1.1
75	SALMIŅŠ KALVIS	Institute of Astronomy, Association FOTONIKA-LV, University of Latvia	GFZ Helmholtz Centre Potsdam,	12.02.2014. – 28.02.2014	17	1.1
76	BEZUGLOV NIKOLAY	Univerity of Latvia, Fotonika LV	France, University of Piza	31.01.2014. - 09.02.2014.	10	1.2
77	Hoffman Evan Derek	German Research Centre for Geosciences Potsdam, Germany	University of Latvia, Institute of Astronomy	12.03.2014.-22.03.2014	11	1.1.
78	Svilāns Miķelis	Aeonyx Research Corporation, Aeonyx Photonics Division	University of Latvia, Fotonika LV	07.04.2014. – 13.04.2014.	7	1.2
79	Parseliunas Eimuntas	Vilnius Gediminas University Faculty of Environmental Engineering,	University of Latvia, Institute of Geodesy and Geoinformatics	10.04.2014.-07.05.2014.	28	1.1
80	Saxena Arvind Kumar	Physical Research Laboratory, Space and Atmospheric Science division, (INDIA)	University of Latvia, The Institute of Atomic Physics and Spectroscopy;	12.04.2014.-22.04.2014	11	1.2.
81	Sandra Šmaliņa	University of Latvia, Fotonika LV	The Fraunhofer Institute for Systems and Innovation Research,	04.05.2014.-22.05.2014.	19	1.1
82	Kaspars Mičulis	University of Latvia, Faculty of Physics and Mathematics, Laser Centre	Saint-Petersburg State University, Faculty of Physics,	21.04.2014.-20.05.2014.	30	1.2
83	Apsītis Aigars	The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia	Gothenburg University Physics Department	20.05.2014-26.05.2014	7	1.1
84	Ričardas Rotomskis	Vilnius University, Laser Research Center	Biophotonics Laboratory, Institute of Atomic Physics and Spectroscopy	25.04.2014-30.04.2014	6	1.1
85	Lee Meng Jung	National Tsing Hua University, Taiwan	University of Latvia, The Institute of Atomic Physics and Spectroscopy	01.05.2014-21.05.2014	21	1.2
86	Svanberg Sune Roland Svanberg	Lund University Hospital, Division of Oncology	University of Latvia, Fotonika LV,	24.04.2014.-25.04.2014	2	1.1
87	KOROVIN JEGOR	Amsterdam University, Korteveg - de Vries institute of mathematics	University of Latvia, The Institute of Atomic Physics and Spectroscopy	27.05.2014.-06.06.2014.	11	1.2
88	EVAN DEREK HOFFMAN	German Research Centre for Geosciences Potsdam, Germany	University of Latvia, Institute of Astronomy	7.07.2014-08.08.2014.	32	1.1.
89	ARVIND KUMAR SAXENA	Physical Research Laboratory, Space and Atmospheric Science division, (INDIA)	University of Latvia, The Institute of Atomic Physics and Spectroscopy;	04.08.2014.-10.08.2014.	7	1.2
90	ARVIND KUMAR Saxena	Physical Research Laboratory, Space and Atmospheric Science division, (INDIA)	University of Latvia, The Institute of Atomic Physics and Spectroscopy;	11.08.2014.-20.08.2014.	10	1.2
91	ARVIND KUMAR Saxena	University of Latvia, The Institute of Atomic Physics and Spectroscopy;	University of Oulu, Electronic spectroscopy group	04.09.2014.-12.09.2014.	9	1.2
92	Ilgmārs Eglītis	University of Latvia, Institute of Astronomy	Moletai Observatory Institute of Theoretical Physics and Astronomy Vilnius University,	03.10.2014.-08.11.2014	37	1.2.
93	Reiner Rudolf Jager	Karlsruhe University of Applied Sciences (HSKA) Faculty of Information Management and Media	University of Latvia, Institute of Geodesy and Geoinformatics	10.10.2014.-15.10.2014.	6	1.2

	Seconded person	Home institution	Hosting organization	Secondment duration	Number of days	WP
94	BEZUGLOV NIKOLAY	Santpetersburg State University	University of Latvia, The Institute of Atomic Physics and Spectroscopy	27.10.2014. – 31.10.2014.	5	1.2
95	Kerim Allahverdi	Turkish Scientific and Technological Research Council, Marmara Research Centre, Lasers and Laser Technologies Laboratory	Institute of Astronomy, Association FOTONIKA-LV, University of Latvia	09.12.2014. – 14.12.2014.	6	1.2
96	SALMIŅŠ KALVIS	Institute of Astronomy, Association FOTONIKA-LV, University of Latvia	GFZ German Research Centre for Geosciences, Potsdam	02.12.2014. – 11.12.2014.	10	1.1
97	SARMAH PATHAK JUMISREE	Indian Institute of Teacher Education (Gandhinagar, Gwarat, India), Centre of Education, Department of Physic	University of Latvia, The Institute of Atomic Physics and Spectroscopy	21.12.2014. – 03.01.2015.	14	1.2
98	Dianas Haritonova	University of Latvia, Institute of Geodesy and Geoinformatics	Vienna University, Institute of Meteorology and Geophysics	11.01.2015. – 31.01.2015.	21	1.2
99	BEZUGLOV NIKOLAY	University of Latvia, The Institute of Atomic Physics and Spectroscopy;	France, Univerity of Piza	20.01.2015. – 30.01.2015.	11	1.2

Annex 2: Individual reporting of exchange participants of two way secondments between the FOTOIKA LV research community at the University of Latvia and strategic partners in the EU;

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, phone.	Prof. Dag Hanstorp, born: 19.03.1960, researcher: University of Gothenburg, Department of Physics
Total expenses during trip	Secondment fee -450 EUR
Receiving organization. Hosting researchers:	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry; The Institute of Atomic Physics and Spectroscopy; Association FOTONIKA-LV, University of Latvia Dr.Arnolds Ū belis, Arnolds@latnet.lv Dr.Uldis Berzins, uberzinsh@gmail.com
Home institution	University of Gothenburg, Department of Physics
Date of participation	02.02.2012.- 04.02.2012
Aim of the visit	To adjust plans for long-term cooperation and to provide presentation in the VII Colloquium of the project: FP7-285912, under call FP7-REGPOT 2011-1 FOTONIKA-LV at 2.02.2012, at 10.00
Description of visit (in details)	During the visit: Prof.Hanstorp presented talk under the title: ➢ Insight in Science activities at Gothenburg University and Spectroscopy of Negative Ions - Fundamental Processes, Femtosecond Spectroscopy and Applications in Astrophysics; ➢ Plans of collaboration were discussed; ➢ Meeting with Vice Rector of Science prof. Indrikis Muiznieks
Results achieved	The roadmap of collaboration between FOTONIKA-LV, University of Latvia and Department of Physics, University of Gothenburg, for the next 9 months were designed
Date of the first reporting	February 2012
Longterm feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 6-12 month)	The visit initiated very fruitful collaboration and the results are documented via reporting of U.Berzins, J.Blahins, J.Klavins, A.Apsitis and A.Rieba
Upgrade date	August 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	Prof. Zhongshan Li**,** born: , researcher: Email: *zhongshan.li*@forbrf.lth.se
Total expenses during trip	Secondment fee -600 EUR
Receiving organization. Hosting researchers:	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry The Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia Dr.Arnolds Ū belis,Arnolds@latnet.lv Dr.Uldis Berzins, uberzinsh@gmail.com
Home institution	*Lund university, F*aculty of engineering, Division of Combustion Physics, *www.lunduniversity.lu.se/*, www.llc.lu.se/**.**
Date of participation	02.04.-04.04.2012
Aim of the visit	To elaborate partnership agenda and knowledge transfer.
Description of visit (in details)	During the visit: ➢ Prof. Li worked together with team of researchers from the Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry ➢ Provide lectures in the IX Colloquium of the project: *FP7-285912, under call FP7-REGPOT 2011-1 FOTONIKA-LV: 03.04.2012, plkst.10.00-11.30*
Results achieved	The lecture Zhongshan Li. Insight in the history of collaborations with colleagues in Lund and with our guest Prof. Zhongshan Li. Discussion – how to refresh cooperation.
Date of the first reporting	April 2012
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 6-12 month)	➢
Upgrade date	August 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, phone.	*Edgars Saks, researcher, Physics,* *e-mail: edgars.saks@lu.lv*
Total expenses during trip	4200 EUR
Receiving organization. Hosting researchers, e-mails	Vilnius University Laser Research Centre Dr. Viaceslav Kudriasov, Viaceslav.Kudriasov@ff.vu.lt
Home institution	Association FOTONIKA-LV *Institute of Atomic Physics and Spectroscopy,* *University of Latvia*
Date of participation	From: 03.06.2012. - 30.06.2012
Aim of the visit	The purpose of the visit was to instruct the researcher in principles of operation of femtosecond laser systems and femtosecond spectroscopy techniques, and provide hands-on training in handling and operating femtosecond laser systems and pulsed femtosecond radiation.
Description of visit (in details)	During the visit, the researcher was introduced to the specifics of handling and manipulation of pulsed lasers and pulsed laser radiation in the Training Laboratory of Quantum Electronics and Training Laboratory of Laser Technology and Optical materials. He was also given an opportunity to visit research laboratories of the laser centre and participate in a number of running experiments performed in research laboratories. He also established contacts to local photonics industry, in particular the company Altechna.
Results achieved	Knowledge and experience was acquired to independently handle various types of lasers with short pulse durations in the range of picoseconds and femtoseconds e.g. operating femtosecond pulse Ti:Sapphire (LIBRA) and Yb:KGW (PHAROS) laser systems and their application in ultrafast spectroscopy. He also learned techniques of femtosecond spectroscopy and femtosecond lasers application in micromachining and material processing.
Reporting Date	May 2013
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 4 month)	After the visit of the researcher, a return visit of his host Dr. Kudriasov to the University of Latvia in July 2012. A femtosecond frequency comb has been acquired by the Institute of Atomic Physics and Spectroscopy in August 2013.
Upgrade date	July 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget reg. number	A6-2773-ZF-N-015
Participants	Janis Blahins, born: 16.05. 59 eng, Laborat.of atomic phys&photochem Aigars Apsitis, born: 24.11.58 eng, Labor.of atomic phys&photochem Uldis Bērziņš (from other funds) researcher, Labor.of atomic phys&photochem
Participants e-mail, m.ph.	*janis_59@inbox.lv +371-20042318* *aigars19c@inbox.lv, +371-27439540*
Total expenses during trip	Janis Blahins 8250 EUR Aigars Apsitis, 6900 EUR;
Receiving organization. hosting researcher, e-mail	Gothenburg University Physics Department (Sverige) Dag Hanstorp, f3adag@chalmers.se
Home institution	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia
Date of participation	24.06.2012 - 16.07.2012, 29.07.2012-26.08.2012.
Aim of the visit	Working on elaborating the mobile instrument for negative ion studies, later be moved to Riga. Participating in common experiments and building common publications. Participate in conference EGAS.
Description of visit (in details)	*Task - to acquire hands on knowledge of negative ion research technology:* During the first two weeks we gain insight and understanding of the architecture of negative ion devices, working and modeling principles and critical components was calculated. The equipment consists of a sample of the substance, 3 keV ion (up to 5 keV) indirect glow triode source. Switching polarity of the anode is way how to choose either to tens of nA strong positive ion beam or hundreds of times weaker negative ion beam. After advanced performance three-stage Wien filter that implements mass (spectra) and ion velocity selector and steering functions (M / dM = 40 ... 400), the ion beam is passed onto a Faraday cup detector connected to nanoampermeter (most sensitive scale10 ^ -11 A). After testing this section, we reorganized water-cooling unit and de-ionisated water unit, made a test defecting of forvacuum pump. We succeeded in obtaining a reproducible ion beam and got steering and detection on Faraday cup, although it remained a number of not-so-urgent problems, such as Wien filter section balancing, which is not available anywhere. Remains to be done in the near future - from about half a dozen alternative forvacuumpump pile to construct test bench and

	select the best to be replaced in the apparatus, the current pumps are in critical condition and will not function for a long time. Equipment containing a total of 3 diffusion, 2 turbomol. 1 ion and 4 forvacuum pumps. For measurements with this apparatus, it is necessary to significantly supplement the parts, yet at the site it are available free of charge, so the mainframe content was developed and discussed with experienced people (including Dag Hanstorp), including equipment development strategy and tactics. We got know-how of two alternative techniques of negative ion beam forming, our filament type triode ion and it competitor - sputtering source containing positive Cs ion accelerator onto parabolic mirror concentrating Cs positive ions as film over surface to the sample. Energetic Cs ions sputters a sample, and on the surface undergoes charge exchange reaction so the outbrakes the negative ions of sample substance, what is accelerating to the same mirror and pass it by center hole, resulting in ion beam can reach many nanoamperes. However, such a solution also has drawbacks: for example, the same short work-life as for filament systems (i.e. long idle time while exchange), rather unstable ion flow, sample uniformity, poor repeatability. It was estimated that our triode-type source ought be run the positive ion mode, and organize charge-exchange cesium column after Wien trap. This column was sought and got, and further be organized fabrication and assembly of vacuum unit and connecting flanges. Was negotiated, that the introduction of RF ICP plasma source in place of triode filament may result in much denser plasma and, hence, higher ion flux (in filament emission T is 1200º C and plasma - even up to 10 000° C), but the negative ion mode may happen that beam current does not increase, because the negative ion recombination (decay) rate will increase. Therefore, thinking about the future of this source (and it would be a significant advantage), source must be operated in the positive ion mode, in conjunction with cesium charge-exchange column. We got experience with the filament burn-off and replacement, so the price of 12 hours beam-run was 10 USD and hours of maintenance, respectively transition to RF ICP torch should also be a resource-saving measure. *Task - to get insight in negative ion problematic and objectives of strategy for future actions* The challenge was met in consultations and reading thesis about ten publications, what were promptly scanned; and EGAS Conference as well. We obtained a copy of the conference reports book, and spent a time in personal communications and discussions with doctoral students and lab managers, incl. Dag Hanstorp and his four co-workers. Despite the fact that our group was consecrated by long and detailed visions (considering that it will be given in right time when technical problems will be solved and our potential and capacity will be understood); must be pointed out that Dag Hanstorp this vision have, and has a wealth of options that we will be given in due course. Thus explicitly confirmed that there are many vacant thematic and possible many distortable surveys at theme of negative ions, for example, mapping the energy levels or implement tungsten-hafnium dating methods of planetary Earth age since the last supernova explosion. Probably most immediate use of equipment be energy of the interaction

	of Rydberg stats experiments. The equipment is made to be used with good mobility, for example to guest at appropriate particle accelerator radiation source or any special laser source location. In such case we may get available such capabilities what are not available to none negative ion explore unit over the world. Therefore, it is essential to build a machine highly mobile, modular, easy disassembling, dividable into parts. At present, the machine is built around L180xB90xH170 cm in two blocks, one about 0.7 tons to 5 cm wheels, the other a little bit lighter. Looking to the future, enrolled in the initial contacts with the Stockholm synchrotron (source) where I had an excursion, some ideas says to make a friendship with Heidelberg laser laboratories and the US Berkeley particle accelerator team, who is interested in the mobile device to try their innovative graphite time resolved PEARLS detector. Plans have been developed in collaboration with the Goteborg group and found that the future can be planned number of common experiments in Riga and Gothenburg. Any case, the scenarios about apparatus allows it to become the excellence center in the world if the good job is done, and a probably gives the multitude of uses, including a less scientific but more practical value - that is, potentially commercialized ion implantation services or epitaxy at conjugation with LU-ASI vacuum-sputtering installation. *Currently are disassembled from the various other equipment components are assembled for our becoming (Gothenburg-Riga-Ion-Beam-Apparatus-Mobile):* The second rack frame with an optical table, neodymium YAG laser with a pulse power of about 5 MW, with power supply of about 60x60x90 cm and a weight of 150 kg (1080 nm and 550 nm and 385 nm), cesium charge-exchange column with a vacuum pump approximately 170x50x90cm, about 150 kg , beam deflection quadrupole with 300 l/s vacuum turbo and ultra-high vacuum ion pump for reaction zone about 170x50x90 cm and 100 kg, and an electron Time-of-Flight type spectrometer coupled to an experimental reaction chamber (requires 10^-11 Torr pressure) ion pump attached to the turbo 600 l/m pump and two-stage oil-based forvacuum pump (170x90x120 cm). It is not known o the TOF`s microchannel detector matrix is broken or good, but it may be purchased for the project if the need. Some amount of funding will need to few tens parts machining (eg, flanges, but it is not a large amount and at good luck will be covered by Gothenburg) - clearly more efficient and even cheaper and far better quality would be to use Chalmers workshop. Seems LU-ASI funds will be mandatory to acquire a DAQ card for experiment computerization and data logging/processing - which at LU-ASI is currently innovative approach, but valuable contribution, being the leading trend for laboratory data management and instrument virtualization today, with extra capacity and flexibility. *Plan for future activities relating to transport equipment and transport.* Specifying the dimensions and weight are clear the light vehicle is too light. The lightweight trailers equipment could undergo undue high

vibrations, so a more realistic alternative is rented semi-heavy minibus. Acquainted with the transport company options, it became clear that heavy trucks are not exactly the cheapest solution, but it is price competitive. However, there is a very high and very high risk that installation will Riga repeatedly re-loaded many times and as result damaged, as tells many experience-based evidences. The equipment has many fragile protruding parts, but the trailers are on the ferry freight charges separately from the machine and even if our people stands an escort for monitoring the process of stacking at port will most probably not allowed by port orders. The remaining option is from VW-T3 up to VW-LT28 or similar. Where to make all build-up works. Strictly it is possible at Riga, but at Gothenburg we have far wider capacities of spare parts, advice, workshops etc., so undoubtly the mounting and testing must be done there and only after first success apparatus may be forwarded to Riga. When – probably in 2013 or 2014.

Take part in experiments and to facilitate the preparation of publications
Task was much disturbed by hard problem at sputtering (GUNILLA) ion research apparatus detector unit, and new-appeared heavy challenges OPO wavelength scan-source of the laser beam, namely output angle stability of the harmonic extraction mode was shaking, caused by angle hysteresis compensator computer program in collaboration with the piezoelectric actuator. In fact, the task was enstarted only after the EGAS conference especially by my colleague Klavins after my return home.

My contribution in this area is constructed sputtering ion source switcher circuit, what interrupts beam while laser pumps up and permits beam only when laser shot is going on, with appropriate pre and after timing. Factually it consists on two HV source (5 kV 30 mA) what will be strobed with 11 ms long laser pulse once every 100 ms period. While to construating I analyzed plenty of alternatives so I got huge knowledge of parts nomenclature and techniques of HV pulsing, as well about opto-transmission lines. The laser works in heavy EMI polluted environment and many tens on meters afar from beam source, therefore only possible method for to avoid the crosstalk was use the opto-transmission line, and it may be beneficial to use it wider even at our institute at future, because it is cheap, prost and highly stable, and with exceptional accuracy. It is hoped, as shows calculations, that maintenance time schedule may arise from 10 work-hours by the old – up to quarter of year by ne new, hopefully, and ion beam stability will arise significantly. The final mounting of missing parts was left at hands of A.Apsitis. If successful implementation, we would have the moral right to participate in their publication, experiment, and provide this contribution as a logical appreciation of around million worth of mobile equipment (GRIBAM) donations made by Swedes. The article will be made some when after the basical test of new options.

Task - to participate EGAS Conference
Task completed, the conference show many world-class discoveries ideas that may be useful in the future or LU-ASI sci seminars, and

	cannot exclude the possibility of benefit at searching for partners, so I was also collected contact data collected almanac conference publications (both paper and pdf version). Obtained two 2012-optics and photonics component catalogues, each with a volume of several thousand pages, find plenty of useful contacts for possible acquisitions of material manufacturers and suppliers needed at the nearest future. *Task - to find out more detailed information of Sweden produced cleanroom anti-dust water based epoxi paints.* This task was for a while failed to meet, the complete lack of transport to 60 km afar plant and its short working hours due. Supposedly this task will have to either distance or next Chalmers Institute of visits when my car will be available at next visit. The Stockholm concurrent plant both times I passed through, because it was closed for interrupt.
Results achieved	According to explanations above
Reporting date	August 2012
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 4 month)	✓ Short stand referate at EGAS, Gothenburg ✓ 28/29 aug.2012 Photonics Technologies - Riga 2012 two referates – two publications in conference book ✓ Jun.2013 article in Slovakian conference book MEASUREMENT-2013 ✓ Jul.2013 stand referate co-authoring at conference at US ✓ Aug.2013 Publication about pulsed sputtering source and about PEARLS in the progress.
Upgrade date	Aug 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant	***Janis Klavins**, Born* -02,05,51, senior researcher, JKlavins@latnet.lv, +37129259851
Total expenses during trip	_____ 4200,- _____ EUR
Receiving organization	Gothenburg University Physics Department (Sverige) Dag Hanstorp, f3adag@chalmers.se
Home institution	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia
Date of participation	From 2012-07-01 to 2012-07-28
Aim of the visit	To develop a mobile ion beam apparatus for fundamental research of negative ion and laser radiation interaction
Description of visit (in details)	1) Exchange of knowledge and planning of negative ion beam apparatus (GRIBAM) in contact with prof. D. Hanstorp group 2) Experimental work to arrange the prototype of negative ion beam source crossed by laser beams and with the electron energy spectrometer 3) Participate in the negative ion experiments running in the host institute's laboratories. 4) Planning objectives of common experiments.
Results achieved	1) Conceptual design of the mobile apparatus GRIBAM has been fixed. First attempts to build it up and test it were successful. 2) Good perspectives for common scientific collaboration with University of Gothenburg in the field of fundamental research with negative ions.
Reporting Date	July 2012
Longterm feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 6-12 month)	The visit contributed in preparation of cooperation via agreement to raise three project proposals: ➢ Dr.Hab. Uldis Bērziņš&Dr.Dag Hanstorp. Experimental Studies of Negative Ions: Design of Mobile Apparatus and Experiments Using various Radiation Sources, Latvian Science Council call. ➢ Dr.h.Uldis Berziņš. Coodinator Spectroscopy of Ions Using Lasers and Synchrotron Radiation – a Global Scale Community. IONS SPECTRA, FP7-PEOPLES-IRSES-2013,Nr 612582, ➢ **Cooperation support project between University of Latvia and Freiburg University: "Experimental research dedicated to interactions of negative ions with femtosecond laser light beams financed**

	Baltisch-Deutsches HOCHSCHULKONTOR Baltijas-Vācijas Augstskolu birojs Reģ. Nr. 40008138741 Kalķu ielā 1 – 404, Rīga, LV - 1658 Tālrunis 67286033, fakss 67217859, hochschulkontor@lu.lv ➢ Other results of the visit are documented via reporting of U.Berzins, J.Blahins, A.Apsitis and A.Rieba
Upgrade date	August 2013

„Unlocking and Boosting Research Potential for Photonics in Latvia – Towards Effective Integration in the European Research area"
"Atbalsts fotonikas jomai Latvijā virzībā uz efektīvu integrāciju Eiropas Pētniecības telpā"

Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, phone.	Prof. Stefan Andersson-Engels, , stefan.andersson-engels@fysik.lth.se, Tel: +46462223121
Total expenses during trip	Secondment fee - 450 EUR
Receiving organization. Hosting researchers:	Laboratory of Biophotonics, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia Dr.Janis Spigulis, Janispi@latnet.lv
Home institution	Departent of Physics, Lund University, P.O. Box 118, SE-221 00 Lund, Sweden
Date of participation	From 22.08.2012. – 24.08.2012.
Aim of the visit	Research training course "Photonics Technologies – Riga 2012", August 23-25, 2012.
Description of visit (in details)	Research training course "Photonics Technologies – Riga 2012", August 23-25, 2012. Giving lecture, taking part of discussions and providing feedback on student posters
Results achieved	About 50 students took part in an intense course in Biophotonics by prominent researchers in the field. They thus learned the basics of biophotonics, got exposed to the researchers in the field and their research (in the conference following the training course, and hopefully matured in research methodology and critical thinking.
Date of the first reporting	September 2012

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, phone.	Matti Kinnunen, matti.kinnunen@ee.oulu.fi, +358294487686
Total expenses during trip	Travel EUR Secondment fee - EUR
Receiving organization. Hosting researchers:	Laboratory of Biophotonics, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia Dr.Janis Spigulis, Janispi@latnet.lv
Home institution	University of Oulu, Department of Electrical Engineering
Date of participation	From 23.08.2012. – 24.08.2012.
Aim of the visit	Research training course "Photonics Technologies – Riga 2012", August 23-25, 2012.
Description of visit (in details)	The duration of the visit was limited to three days 22nd -24st August 2012. It covered the period of Research training course "Summer school "Photonics Technologies – RIGA 2012. The title of the presentation was: "Light-matter interaction studies in red blood cell suspensions and at a single cell level".
Results achieved	Successful summer school.
Date of the first reporting	September 2012
Longterm feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 4 month)	I am satisfied with the visit and it is a good way to build up collaboration. I am ready to continue this kind of activity.

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, phone.	Prof. Dag Hanstorp, born: 19.03.1960, researcher: University of Gothenburg, Department of Physics Dag.Hanstorp@physics.gu.se
Total expenses during trip	Travel - 2720.00 SEK Secondment fee -1050 EUR
Receiving organization. Hosting researchers:	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia Dr.Arnolds Ū belis, Arnolds@latnet.lv Dr.Uldis Berzins, uberzinsh@gmail.com
Home institution	University of Gothenburg, Department of Physics
Date of participation	22.08.2012. – 28.08.2012
Aim of the visit	• To summarize the outcomes of 7 months of cooperation and to specify next milestones in the roadmap of cooperation. • To provide lectures in Research training course "Photonics Technologies – Riga 2012", August 23-25, 2012 and in the 1st International Conference "Photonics Technologies – Riga 2012", August 27-28, organized by the project: FP7-285912, under call FP7-REGPOT 2011-1
Description of visit (in details)	During the visit: Prof. Hanstorp worked together with team of researchers from the Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry Contributed and presented the following in above mentioned events: 1) Training Course lectures: ***Friday, 24 August, 2012*** **PHOTONICS TECHNOLOGIES** ➢ ***Dag Hanstorp*, SE**. Mass and laser spectroscopy of negative ions; ➢ ***Dag Hanstorp*, SE**. Micro fluidics and Optical manipulation; 2) The 1st International Conference "Photonics Technologies – Riga 2012", August 28: ➢ ***Janis Blahins, Aigars Apsitis*, LV & *Prof. Dag Hanstorp*, SE**. Mobile ion beam instrument – presentation in parallel session of the conference; ***Tuesday, 28 August, 2012, Second plenary,*** *Second part*

	Advances in Photonics Technologies from Space to the Nanoworld. Chaired by: *Dr. Hab. Uldis Berzinsh* ➢ *Prof. Dag Hanstorp*, SE & *H.Hultgren, M.Eklund, I.Yu.Kiyan*, DE. Visualization of electronic motion in an atomic ground state 3) Participation in the Round Table panel _ Future challenges of research in photonics in the Baltics and opportunities offered by FP7 and coming HORIZON 2020
Results achieved	The roadmap of collaboration between FOTONIKA-LV, University of Latvia and Department of Physics, University of Gothenburg, for the next 9 months were designed
Date of the first reporting	August 2012
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 6-12 month)	The visit contributed in extension of cooperation via agreement to raise two project proposals: ➢ Dr.Hab. Uldis Bērziņš&Dr.Dag Hanstorp. Experimental Studies of Negative Ions: Design of Mobile Apparatus and Experiments Using various Radiation Sources, Latvian Science Council call. ➢ Dr.h.Uldis Berziņš. Coodinator Spectroscopy of Ions Using Lasers and Synchrotron Radiation – a Global Scale Community. IONS SPECTRA, FP7-PEOPLES-IRSES-2013,Nr 612582 Other results of the visit are documented via reporting of U.Berzins, J.Blahins, J.Klavins, A.Apsitis and A.Rieba
Upgrade date	August 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	Prof. **David Pegg,** Oak Ridge National Laboratory (USA) born: 02.09.1940, researcher: djpegg@me.com, djpegg@utk.edu
Total expenses during trip	1186 USD Secondment fee -1350 EUR
Receiving organization. Hosting researchers:	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia Dr.Arnolds Ū belis, Arnolds@latnet.lv Dr.Uldis Berzins, uberzinsh@gmail.com
Home institution	Oak Ridge National Laboratory (USA)
Date of participation	22.08.2012. – 28.08.2012
Aim of the visit	To provide lectures in Research training course "Photonics Technologies – Riga 2012", August 23-25, 2012 and in the 1st International Conference "Photonics Technologies – Riga 2012", August 27-28, organized by the project: *FP7-285912, under call FP7-REGPOT 2011-1*
Description of visit (in details)	During the visit: 1) Prof. Pegg worked together with team of researchers from the Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry; 2) Presented the lecture for Training Course: ***Friday, 24 August, 2012,*** **PHOTONICS TECHNOLOGIES** ➢ ***David Pegg*, USA**. The Story of the Oak Ridge 3) Provided gest lecture to The 1st International Conference "Photonics Technologies – Riga 2012", August 28: on Tue***sday, 28 August, 2012, Second plenary,*** *First part.* ***Advances in Photonics Technologies from Space to the Nano-world*** ➢ *Prof. David Pegg*, USA. Fast Ion Beam Spectroscopy
Results achieved	Training provided to the community of young researchers. Roadmap of activities in the domain of negative ion beam research
Date of the first reporting	August 2012
Long-term feedback: Conf. thesis, publications, project initiatives etc.	The visit contributed in extension of cooperation via agreement to raise FP7 International Staff Exchange project proposals and involvement in the consortia partners from USA - Lawrence Berkeley National Laboratory, Advanced Light Source (ALS), http://ssg.als.lbl.gov/:

Upgrade (after each 6-12 month)	➢ Dr.h.Uldis Berziņš. **Coodinator** Spectroscopy of Ions Using Lasers and Synchrotron Radiation – a Global Scale Community. IONS SPECTRA, FP7-PEOPLES-IRSES-2013,Nr 612582
Upgrade date	August 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	Prof. Henrik Cederquist**,** born: 02.09.1940, researcher: cederq@fysik.su.se, +46 8 5537 8626
Total expenses during trip	Secondment fee -750 EUR
Receiving organization. Hosting researchers:	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia Dr.Arnolds Ū belis, Arnolds@latnet.lv Dr.Uldis Berzins, uberzinsh@gmail.com
Home institution	Stockholm University, Physics Department, DESIREE
Date of participation	24.08.2012. – 28.08.2012
Aim of the visit	To provide lectures in Research training course "Photonics Technologies – Riga 2012", August 23-25, 2012 and in the 1st International Conference "Photonics Technologies – Riga 2012", August 27-28, organized by the project: FP7-285912, under call FP7-REGPOT 2011-1
Description of visit (in details)	During the visit: 1) Prof.Cederquist worked together with team of researchers from the Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry 2) Presented the lectures for Training Course: ***Saturday, 25 August, 2012,*** **SPACE TECHNOLOGIES** ➢ ***Henrik Cederquist*****, SE**. Interactions with carbon bearing molecules and cluster - fullerenes and Polycyclic Aromatic Hydrocarbons 3) Contributed with quest lectures to the 1st International Conference "Photonics Technologies – Riga 2012", August 28: ***Tuesday, 28 August, 2012, Second plenary,*** *Second part* ***Advances in Photonics Technologies from Space to the Nanoworld.*** Chaired by: *Dr. Hab. Uldis Berzinsh* ➢ *Prof. Henrik Cederquist*, SE -The DESIREE-facility - a new instrument for studies of ion interactions
Results achieved	Training provided to the community of young researchers. Roadmap of activities in the domain of negative ion beam research and cooperation with Stockholm University
Date of the first reporting	August 2012
Long-term feedback:	The visit contributed in extension of cooperation via agreement to

Conf. thesis, publications, project initiatives etc. Upgrade (after each 6-12 month)	raise FP7 International Staff Exchange project proposals and involvement in the consortia Stockholm University: ➢ Dr.h.Uldis Berziņš. **Coodinator** Spectroscopy of Ions Using Lasers and Synchrotron Radiation – a Global Scale Community. IONS SPECTRA, FP7-PEOPLES-IRSES-2013,Nr 612582
Upgrade date	August 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, phone.	Prof. Klaas Bergman, senior researcher, e-mail: bergmann@rhrk.uni-kl.de
Total expenses during trip	Travel 262,93 EUR Secondment fee -900 EUR
Receiving organization. Hosting researchers:	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia Dr.Aigars Ekers, Aigars.Ekers@lu.lv
Home institution	Technische Universitaet Kaiserslautern, Fachbereich Physik
Date of participation	From 26.08.2012. – 31.08.2012.
Aim of the visit	The aim of the visit was to discuss the latest experimental and theoretical results obtained by the group of the hosting scientist Dr. Ekers, and to participate in the 1st International Conference "Photonics Technologies – Riga 2012", August 27-28, 2012.
Description of visit (in details)	During the visit, the latest experimental and theoretical results on interferences of laser dressed states in ladder level systems were discussed. The researcher also participated in the conference Photonics Technologies – Riga 2012" organized by the association FOTONIKA-LV, giving an oral presentation and chairing a conference session. He also participated in the science policy roundtable on photonic technologies involving international experts and Latvian national parliament members. An agreement about transfer of used argon ion laser and ring dye laser systems from the Technical University of Kaiserslautern to Riga was also signed with the administration of the University of Latvia.
Results achieved	1) The researcher gave a plenary talk entitled „A new concept for high accuracy and/or high speed laser ranging", and chaired the session "Future Photonics Technologies" at the Conference "Photonics Technologies – Riga 2012"; 2) the researcher participated in the science policy roundtable with participation of international experts, industry representatives, and national parliament members; 3) agreement was signed with the University of Latvia on the transfer of a tunable laser system to property of the University of Latvia. This lasers system is now integrated into the experimental infrastructure of the laboratory of Dr. Ekers;

	4) discussions on efficient quantum state manipulation schemes allowed to identify promising directions to be explored in future research. Details of a follow-up visit of Dr. Ekers to Kaiserslautern were discussed and agreed upon.
Date of the first reporting	August 2012
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 6-12 month)	1) The abstract „A new concept for high accuracy and/or high speed laser ranging" was published in the abstract book of the 1st International Conference "Photonics Technologies – Riga 2012", August 27-28, 2012. 2) the science policy roundtable was featured in the 11 September 2012 issue of the leading Latvian entrepreneurship newspaper „Dienas Bizness", including important statements by Prof. Bergmann; 3) several follow up visits of Dr. Ekers to the Technical University of Kaiserslautern took place throughout 2012 and 2013. These visits resulted in transfer of additional scientific equipment from Kaiserslautern to Riga in spring 2013. They also included extensive discussions on laser ranging techniques and challenges of industry-academia collaboration, which facilitated initiation of an industry funded project on the development of a long-range 3D scanner proof-of-concept device at the Institute of Atomic Physics and Spectroscopy of the University of Latvia. A further visit of Prof. Bergmann to Riga is scheduled at the end of August 2013, and in November 2013 he will give a course at the University of Latvia on Optically Driven Adiabatic Transfer Processes. 4) Prof. Bergmann serves as a FOTONIKA-LV project's Steering Committee member. During his visit of August 2012 he participated in the Steering Committee meeting, and will participate in a meeting also during his Riga visit of August 2013.
Upgrade date	August 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant	*Name, surname, position, department* Janis Blahins, born: 16.05. 59. eng, Laborat.of atomic phys&photochem Aigars Apsitis, born: 24.11.58 eng, Labor.of atomic phys&photochem
Participant e-mail, m.ph.	*janis_59@inbox.lv +371-20042318* *aigars19c@inbox.lv, +371-27439540*
Total expenses during trip	Travel costs 206,51 Janis Blahins, 2300EUR Aigars Apsītis, 2300 EUR
Receiving organization, hosting researcher, e-mail	Gothenburg University Physics Department (Sverige) Dag Hanstorp, f3adag@chalmers.se
Home institution	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry The Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia
Date of participation	From___28.10.2012.____ to ___12.11.2012.____
Aim of the visit	1)Participate in common experiments 2)Compose & adjust ion beam systems into GRIBA(m)
Description of visit (in details)	zThe ideology of new apparatus is erected and composed to AutoCAD file, and discussed with Dag Hanstorp and other experienced people in his lab. The mainframes of apparatus first stand is machined and mounted, cooling water system is composed. First insight in what we may get out of details at cellars of Gothenburg University. The idea of strobed sputtering source had been born from first experiment results: the life of ion source between maintenances stays annoying short, thus the problem may be solved by beam pulser. For that electronic circuit first version is constructed and soldered for basic tests are ready. Seminary of laboratory had been listened, and 5 PhD dissertations on negative ion thematic had been read and scanned to have a permanent source of information on theme. The new knowledge attained had been reported more detailed with ppt presentation at Riga seminar, at LU-ASI. Presentation was made while at Gothenburg.

Results achieved	Apparatus has attained a first shape, bundle of lathe and welding jobs had been specified for Goethenburgian mechanists are done, the wide front of future jobs had set on. The understanding of negative ion research technologies was got. The financial basis of apparatus is that Gothenburg gives us an ideas and everything what is worth to use in apparatus from their cellars, where the eldened techniques are stored before decommissioning, and partially cares about sleeping place arrangements for our visits. Whist Riga side is caring about physical montage of apparatus and adjusting, and commanded persons job payments, and some relatively smaller inputs into buying new details if they shall be needed and if Gothenburg haven't them in unneeded stock. In the end when GRIBA(M) will be ready, we organize common experiments and move it to Riga, where it is kept at LU-ASI cellar, when it will be renovated enough for to let machine comes in.
Long-term feedback: conference thesis, publications, project initiatives etc. Upgrade (after each 4 month)	Pulsed beam system is well tested and found be very good. Publication about this achievement had been begun to write up, but first results are repres4ented in stand referate Jul.2013 at USA.
Upgrade date	06.2013.

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, Mob.Phone	*Janis Spigulis, Leading Researcher, IAPS Biophotonics Laboratory: Janispi@latnet.lv, t.+37129485347*
Total expenses during trip	205.68 LVL 3900.00 EUR
Receiving organization, Hosting researchers, e-mail	Lund Laser Centre, Lund University, Sweden. stefan.andersson-engels@fysik.lth.se
Home institution	Laboratory of Biophotonics, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia
Date of participation	From15/10/2012 to 9/11/2012
Aim of the visit	Joint studies and discussions on new projects in biophotonics;
Description of visit (in details)	**15-19/10**: accommodation, acquaintance with MLC and safety regulations for Division of Atomic Physics, visits to laboratories. Participation at the bi-annual Rydberg lecture – 2012 "Trapped antihydrogen: a first glimpse of its inside" (Svante Jonsell, 16/10) and the related dinner. Discussions with SPIE Board meeting members, including SPIE President and CEO (17/10). Participation in sub-nanosecond time resolved optical measurements with Dr. Dmitry Khoptyar (18-19/10). **22-26/10**: Presentation at the MLC seminar (22/10 at 9am, title: "Optical diagnostic techniques for dermatology and cardiology: from lab to clinic"). Further discussions on this and related topics with professors Sune Svanberg, Katarina Svanberg, Stefan Andersson-Engels and Dr. Mikkel Brydegaard. Participation at the regular meeting of the Division of Atomic Physics and at the luncheon on behalf of the 20th anniversary of Lund High Power Laser Facility (26/10). **29/10-2/11**: Discussions on clinical applications of the photoplethysmography video-imaging for anaesthesiology control, agreement on further collaboration and visit to Riga (MD Emily Krite Svanberg). Participation at the seminar of LLC Combustion Diagnostics group (presentation of Dr. M. Brydegaard). Presentation at mini-seminar on potential of RGB sensors for clinical spectral imaging. Agreement on structure and content of joint journal paper on poly-spectral imaging technology. **5-9/11:** Visits to laboratories of High-power laser facility, meetings and discussions with potential future collaborators. Preparation of the

	1st draft of the joint publication at a peer-reviewed journal (provisionally: J.Spigulis, M.Brydegaard, S.Andresson-Engels, "Spectral RGB imaging of biosamples at fixed illumination wavelengths"). Meeting with MD E.K.Svanberg on distant PPGI anesthesiology control technologies, agreement on her work plan during visit to Riga next spring.
Results achieved	1. Valuable working contacts with a number of world class photonics leaders established. 2. Research of IAPS Biophotonics laboratory presented and discussed at two seminars. 3. Experience in sub-nanosecond time resolved spectroscopy gained for completion of the FP7 Laserlab Europe project tasks. 4. Draft manuscript for a peer-reviewed joint publication prepared and discussed. 5. The IAPS-developed biophotonic PPGI technology transferred for future implementation at Lund University Hospital.
Reporting date	November 2012
Longterm feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 4 month)	Conference thesis: J.Spigulis. Joint research activities with Lund University Medical Laser Centre 71st annual scientific conference of University of Latvia, Book of Abstracts, p.33 (2013) J.Spigulis (invited). Non-contact skin assessment for Dermatology and Anaesthesiology. PIERS (Progress in Electromagnetic Research Symposium), Stockholm, 13 Aug. 2013. Programme, p.63. Abstract on CD. Abstract to SPIE Photonics West '2014 conference: J.Spigulis. Single snapshot RGB multispectral imaging at fixed wavelengths: proof of concept (submitted).
Upgrade date	21/08/2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants e-mail, phone.	**PhD cand. Dainis Jakovels**, Researcher, E-mail: dainis.jakovels@lu.lv Phone: +37129116741
Total expenses during trip	2900 LVL 4200 EUR
Receiving organization. Hosting researchers, e-mails	Linkoping University, Department of Biomedical Engineering Prof. Goran Salerud E-mail: goran.salerud@liu.se
Home institution	Association FOTONIKA-LV, University of Latvia, Institute of Atomic Physics and Spectroscopy
Date of participation	From 7.11. to 4.12. 2012.
Aim of the visit	Scientific cooperation between institutions and comparison study of RGB and Laser Doppler Perfusion imaging.
Description of visit (in details)	Introduction to laboratories and research divisions of LiU Department of Biomedical Engineering. Presentation about my previous research results at the department. Planning of comparison study of RGB and Laser Doppler Perfusion imaging for assessment of skin hemoglobin/blood microcirculation. Literature study, preparation of workspace and planning of provocation tests. Mechanical provocation tests – arterial and venous occlusion of forearm. Chemical provocation tests – skin reaction to "deep heat" ("Tiger Balm"); heat response to local anesthesia after application of EMLA cream. UV-B provocation tests – UV-B induced erythema observation at 6 different doses. Pre-processing of the results. Visit to FORAN Remote Sensing AB.
Results achieved	Got introduction to laboratories and research division of LiU Department of Biomedical Engineering. Did comparison study of RGB and Laser Doppler Perfusion imaging for assessment of skin hemoglobin/blood microcirculation: - 6 mechanical provocation tests; - 9 chemical provocation tests; - 2 UV-B measurement series. Data processing is in progress.

	Presentation at Photonics Section of Annual Conference of University of Latvia 2013 is submitted. The results will be used for preparation of a manuscript.
Reporting Date	December 2012
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 4 month)	Conference thesis: D.Jakovels, „Research training experience in the department of biomedical engineering at Linkoping University," 71st annual scientific conference of University of Latvia, Book of Abstracts, 25-26 (2013) The results will be used for preparation of PhD thesis.
Upgrade date	21.08.2013.

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant	*Kalvis Salmiņš, born:* 07.12.1962 *Institute of Astronomy, Kalvis@latnet.lv*
Total expenses during trip	_____LVL ____2250_____ EUR
Receiving organization	GFZ Helmholtz Centre Potsdam, Dr.L.Grunwaldt, grun@gfz-potsdam.de
Home institution	Institute of Astronomy Association FOTONIKA-LV University of Latvia
Date of participation	From_____21.11.2012__ to _____05.12.2012.
Aim of the visit	Work and satellite laser ranging data post processing methods.
Description of visit (in details)	Learned about use of high accuracy tiltmeters for monitoring laser tracking telescope mount stability and diurnal changes and first testing results for the new single photon detector SPAD models, aircraft safety issues and the new telescope control system, developed by SpaceTech GmbH. Discussion with Andre Kloth from SpaceTech GmbH about implementation of the satellite tracking algorithms and star model and eventual use of the SpaceTech control software at other stations; data exchange issues with their software and data processing system developed in Riga. Continued work on the data processing software, shared by Riga and Potsdam SLR stations, added changes to support satellite center of mass corrections, added data upload capability to the data center's FTP server.
Results achieved	Satellite center of mass correction added to the data processing algorithm, incorporated required changes for data delivery to data centers into data processing software.
Date of the first reporting	December 2012
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 6-12 month)	The visit allowed to finalize the role of GFZ Helmholtz Centre Potsdam in the consortium of the proposal: *FP7-PEOPLE-2013-IRSES,* **Proposal No.** *612609,* **Acronym:** *GEODYNAMICS.* ***Tittle****: Towards Progress in Geosciences and Satellite Ranging Technologies*
Upgrade date	August 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants, *Name, surname, position, department*	Janis Blahins, born: 16.05. 59 eng, Laborat.of atomic phys&photochem Aigars Apsitis, born: 24.11.58 eng, Labor.of atomic phys&photochem Aigars Rieba, born 20.06.58
Participant e-mail, m.ph.	*janis_59@inbox.lv +371-20042318* *aigars19c@inbox.lv, +371-27439540* *aigi9@inbox.lv, +371-29221591*
Total expenses during trip	Travel costs total: 746 LVL Janis Blahins,1500 EUR Aigars Apsiti, 1500 EUR Aigars Rieba, 1500 EUR
Receiving organization, hosting researcher, e-mail	Gothenburg University Physics Department (Sverige) Dag Hanstorp, f3adag@chalmers.se
Home institution	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia
Date of participation	From___12.01.2013.____ to ___21.01.2013
Aim of the visit	1)Participate in common experiments; 2)Compose & adjust ion beam systems into GRIBA(m).
Description of visit (in details)	The electrical mounting of sputtering source pulsing circuit had been graduated, and tested with means of simulation of input signals and oscilloscope. Circuit had mounted in appropriate housing, on isolation transformer, with safety insulator rods on all adjusting control knobs. Housing was erected as high voltage proof insulator box, specially made for this aim, the reason was safety considerations until 10 kV. There was identified candidate of high voltage supply (Spellman), able to work with this circuit, and defected that it must be transported to Riga for repairing jobs. GRIBAM had been undergone helium vacuum leak tester manipulations and many leaks had been detected and repaired. GRIBAM had been open of vacuum chambers and cleaning with vacuum compatible spirits, thus regaining a sufficient vacuum. In the main stand had been composed and applied the laser guide, allowing to con-pass ion ray in-line at all serial vacuum vessel ion-optics tracts. The heights and horizontals of all vessels had been adjusted to be in-line with high accuracy.

	The sample of technical argon gas had been used for evaluating the ion flux, for senor element using a Faraday cup. Ion flux was detected, but it was highly unstable due instability of gas valve inappropriateness to so small gas fluxes. There was by mass-spectra detected, that ultra-short lifetime of tungsten filament was caused of atmospheric oxygen content, and it must be explored where it leaks between gas bottle and vacuum chamber. Plenty of details of second stand of GRIBAM (after beam curve) was constructed and made in drawings to be ordered to be machined at mechanical workshop.
Results achieved	First positive ion flux samples was got, however not stable enough. Identified instability reasons. Mechanical details of second stand had been ordered. Sputtering source switch had been done and high voltage source had been transported to Riga, where it was later repaired and transported back.
Reporting date	January 2013
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 4 month)	Spellman was successfully repaired month afterward and at next visit installed.
Upgrade date	03.2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	*Name, surname, position, department* Janis Blahins, born: 16.05. 59 eng, Laborat.of atomic phys&photochem Aigars Apsitis, born: 24.11.58 eng, Labor.of atomic phys&photochem Aigars Rieba, born 20.06.58 eng, Labor.of atomic phys&photochem
Participants e-mail, m.ph.	*janis_59@inbox.lv +371-20042318* *aigars19c@inbox.lv, +371-27439540* *aigi9@inbox.lv, +371-29221591*
Total expenses during trip	Travel total _____XXX_____LVL Janis Blahins, 2550 EUR Aigars Apsitis, 2550 EUR Aigars Rieba, 2550 EUR
Receiving organization, hosting researcher, e-mail	Gothenburg University Physics Department (Sverige) Dag Hanstorp, f3adag@chalmers.se
Home institution	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry The Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia
Date of participation	From___09.03.2013.____ to ___25.03.2013.____
Aim of the visit	1)Participate in common experiments 2)Promote ion beam systems into GRIBA(m)
Description of visit (in details)	Repaired Spelmann high voltage source was delivered to sputter source, the insulated high voltage cage was re-built to be higher and able to contain this source. All inner wiring was made, checked and a first experiment was done to test abilities of new strobed regime work. Trials to repair last existing six-channel vacuum meter was made, but it turned out that central processor unit is damaged and there are no ways to repair it. Therefore were selected compatible candidates for other vacuum meters, what are able to coexist in the measuring control system of GRIBAM. Last machined vacuum vessel details was received and mounted to GRIBAM after a corner. Heavy leak was detected in newly mounted system, and after long and tricky examination was found wrong o-ring into purge gas valve.

	Vacuum systems after corner was checked, and conjugated together with vacuum devices before corner. It shown good compatibility. Ion flux was bend over the corner but it was unexpectedly week, thus the closer examination must be done in future. First real mass-spectras was measured in hand reading regime. There was used three gases, nitrogen, technical argon and argon-nitrogen mixture, thus the detection identification algorithm may be evaluated be good. Gas flux stability turned out very unstable, inspite of trialing a whole set many possible adjustment valves. That means the special high stability valve must be bought. Consulting with spray-ionisation chamber operators in Stockholm University negative ion apparatus, we got a knowledge that they had very similarly problem for years long and ultimate cure was buy the quite expensive vacuum gauge namely UDV. The authorized seller was identified for our region and getting of price proposal was managed. The principal agreement was gained to write two articles with us as co-authors. One about sputtering source at strobed flux regime for hardly serious magazine, and other as stand referate (poster) at one of possible average level conference, and one conference referate somewhere at Eastern Europe (actually that became later a 15 minute referate ar Slovakian MEASUREMENT-2013).
Results achieved	GRIBAM is very near to operational condition. Common experiments on strobed flux source are provided. Certain needs for buying a specific detail for GRIBAM are specified.
Reporting Date	March 2013
Longterm feedback: conference thesis, publications, project initiatives etc. Upgrade (after each 4 month)	Valve is bought but not yet installed. DAQ card is bought but not yet installed too.
Upgrade date	08.2013.

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant	*Kalvis Salmiņš, Institute of Astronomy, Kalvis@latnet.lv*
Total expenses during trip	_____LVL _____2250_____ EUR
Receiving organization	GFZ Helmholtz Centre Potsdam, Dr. L.Grunwaldt, grun@gfz-potsdam.de
Home institution	Institute of Astronomy, Association FOTONIKA-LV, University of Latvia
Date of participation	From_____13.03.2013____ to ____27.03.2013.
Aim of the visit	Work and satellite laser ranging data post processing methods
Description of visit (in details)	Meeting with Dr. Kirchner from Graz SLR station (Austria) and discussion about tracking of space debris and bistatic laser ranging experiments and technical requirements to participate. Work on data processing software, added preliminary support for the mixed ranging data fitting (orbital and polynomial fitting), added several changes to software to streamline data processing stages and better handle Khz repetition rate ranging data, researched possibility to use simulated ranging data to improve numerical stability when processing very short (less then 1min) orbit segments. Analyzed possibility to add support for processing and storing data from bistatic/asynchronous laser ranging operations: changes in the internal data formats and processing algorithms.
Results achieved	Specified necessary changes in software to incorporate ranging data post processing for the non-cooperative targets like satellites with lost attitude control and provisional support for eventual tracking of space debris, provisional support for mixed data processing algorithm
Date of the first reporting	March 2013
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 6-12 month)	The visit initiated next step in the development of Geodynamics observatory facing serious problems with human resources. Plans for the recruitment of new staff were realized and roadmap for long-term cooperation with GFZ Helmholtz Centre Potsdam and other strategic partner Finish Geodesy Institute was designed.
Upgrade date	August 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants, *Name, surname, position, department*	Aigars Rieba, born 20.06.58 eng, Labor. of atomic phys&photochem Uldis Bērziņš (paid by other funds) researche , Labor.o atomic phys&photochem
Participant e-mail, m.ph.	uberzinsh@gmail.com *46709314977* *aigi9@inbox.lv, +371-29221591*
Total expenses during trip	Aigars Rieba Secondment 2250_ EUR
Receiving organization, hosting researcher, e-mail	Gothenburg University Physics Department (Sverige) Dag Hanstorp, f3adag@chalmers.se
Home institution	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry The Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia
Date of participation	From___06.05.2013.____ to ___20.05.2013.____
Aim of the visit	To expand testing and adjusting of GRIBAM and planning of common experiments
Description of visit (in details)	During this visit the main work was performed on GRIBA (Gothenburg Riga Ion Beam Apparatus). It was moved to new place in order to be able to attach and to test the new linear electron spectrometer. After movement two for-vacuum pumps were substituted and new vacuum heads attached. The extension with detector was attached in 90 degree angle after the quadrupole chamber in order to check and adjust the ion beam line in place where electron spectrometer PEARLS will be attached. Work was performed in close collaboration with PhD student **Olle Windelius.** The lifetime of ion source in argon discharge was substantially extended by finding and substituting critical parts for gas transport tube and flinch with leaking electrode entrance. The small pump unit was built on Argon line in order to avoid the contamination during the filling up the gas bottle. The second activity was performed on tests of High Voltage Pulse source for Sputter Ion source. The lifetime of cathode in source was observed to be longer by two orders of magnitude with duty cycle 1% for HV pulse. For some ions higher ion current during the pulse time was observed than in continues mode. Experiments were performed together with students **Tobias Leopold**. Experimental material

	enough for publication was collected. Third activity was performed on Nd -Yag 20 Hz Brilliant laser. The laser tests were performed with fundamental and doubled frequencies corresponding to 1064 nm and 532 nm. The reasonable output power was obtained. The meeting With prof Dag Hanstorp and Professor emeritus **David Pegg** was held and future plans for nearest experiments, publication policy and next project applications were discussed.
Results achieved	GRIBAM is tested and approved be qualified enough to perform common experiments in PEARLS conjugation with GRIBAM. The time scale at end of July and August beginning was drawn. The experimental basis for publication on pulsed sputtering beam was made. First experience with laser showed those laser consistencies for PEARLS and later GRIBAM experiments.
Reporting Date	May 2013
Long-term feedback: conference thesis, publications, project initiatives etc. Upgrade (after each 4- 12 month)	
Upgrade date	January 2014

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, *Name, surname, position, department*	Janis Blahins, born: 16.05. 59 eng, Labor.of atomic phys&photochem Aigars Apsitis, born: 24.11.58 eng, Labor.of atomic phys&photochem
Participant e-mail, m.ph.	janis_59@inbox.lv +371-20042318 aigars19c@inbox.lv, +371-27439540
Total expenses during trip	Janis Blahins, 2300EUR Aigars Apsītis, 2300 EUR
Receiving researcher, organization, hosting e-mail	Gothenburg University Physics Department (Sverige) Dag Hanstorp, f3adag@chalmers.se
Home institution	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry The Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia
Date of participation	From___07.06.2013.____ to ___22.06.2013.____
Aim of the visit	Participate in common experiments
Description of visit (in details)	After Aigars Rieba at last visit was identified tiny oxygen pollution in filament chamber, we made input inert gas pipe re-mounting from already shortened plastic version to no-plastics glass-pipe version and with that the filament lifetime became more acceptable. PEARLS unit was un-packed and mounted and fixed by three coordinate fixtures to GRIBAM stand. All vacuum tightening was made and checked, all vacuum pumps were checked and were got a knowledge that first input pre-vacuum pump slightly suffers from too small productivity, and would be good to shift it to more powerful. Couple of masspectra was made on Gribam and computer analyzed, to get be sure that everything works well. An article blueprint (first version, what will be further sliffed-up) was made on theme of Sputtering Source innovations and stand referate poster was made for to be used for conference at USA. The TEX programming was learned and experienced, because article at editorial allowed only this computer format. TEX programming was something innovative for LU-ASI for a while. For GRIBAM was introduced newly bought vacuum meters and vacuum-meter heads, thus the stable control of vacuum levels was gained. Ion flux stability was gained quite sufficient, but after a

	bending into quadrupole the flux became very disfocuced. Thus the building in focusing electrodes is essential. Those electrodes were produced, but mounting demanded too much time, so it was left for later activity.
Results achieved	PEARLS is connected and adjusted by coordinates, using an ion flux as indicator. The need for focusing electrodes is detected, and ultimate need for stable inert gas valve is detected. Eventually two publications are expected.
Reporting date	July 2013
Long-term feedback: conference thesis, publications, project initiatives etc. Upgrade (after each 4 - 12month)	
Upgrade date	January 2014

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, phone.	Dr. Malgorzata Anna GLODZ, senior researcher, e-mail: glodz@ifpan.edu.pl
Total expenses during trip	Travel 153,37 EUR Secondment fee -1200 EUR
Receiving organization. Hosting researchers:	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia Dr.Aigars Ekers, Aigars.Ekers@lu.lv
Home institution	Institute of Physics of the Polish Academy of Sciences
Date of participation	From 18.06.2013. – 25.06.2013.
Aim of the visit	To carry out scientific collaboration and prepare a joint publication on energy transfer in excited alkali-metal atom collisions.
Description of visit (in details)	During the visit, the researcher discussed the agreement of her experimental results with the theoretical calculations performed by Riga group. Jointly with the hosting scientists from the hosting group, she worked on the preparation of a joint manuscript. She also discussed the recent results of her group on electromagnetically induced transparency in an ultracold gas of rubidium Rydberg atoms and gave a talk at the colloquium of FOTONIKA-LV. An advanced version of a joint manuscript was performed, which will be finished and prepared after the visit.
Results achieved	1) An advanced version of a joint manuscript on collisional excitation energy transfer between rubidium Rydberg states has been prepared; 2) a talk on EIT in ultracold gas of Rb atoms entitled “Probing a state which is not probed” was given at the FOTONIKA-LV colloquium.
Date of the first reporting	July 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	Prof. Klaas Bergman, senior researcher, e-mail: bergmann@rhrk.uni-kl.de, +49 160 9664 5427
Total expenses during trip	Travel 237.56 Secondment fee 1650.00 EUR
Receiving organization. Hosting researchers: Dr.Aigars Ekers Aigars.Ekers@lu.lv	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia
Home institution	Technische Universitaet Kaiserslautern, Fachbereich Physik
Date of participation	From 20.08.2013. – 30.08.2013.
Aim of the visit	The aim of the visit was to discuss the latest experimental and theoretical results obtained by the group of the hosting scientist Dr. Ekers, and to participate in the 2013 Annual Reporting present Dr. Uebelis.
Description of visit (in details)	During the visit, the latest experimental and theoretical results on population flow in a multi-level, system, driven by two coherent laser field were discussed with the host and students from his group. Also discussed where structural aspects of the FOTONIKA project and the content of the up-coming lecture course "Optically driven adiabatic transfer processes".
Results achieved	1) The researcher participated in the Annual Reporting meeting of FOTONIKA-LV on August 28. In his function as a member of the international advisory committee he did ask a number of questions related to the scientific results achieved and offered comments and suggestions concerning the management of the project. 2) Several scientific issues regarding the physics of coherent excitation in multi-level, multi-laser systems were clarified. 3) The concept of the lecture course, planned for November 2013 was presented to the host and other colleagues interested. Possible modifications of some topical details were discussed in detail and the formal procedures, in particular regarding the exam following the course, were clarified.
Date of the first reporting	September 2013
Longterm feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 6-12 month)	1) Some of the suggestions regarding the project operation and management are likely to be implemented and will help to achieve the project mission. 2) Clarification of some scientific aspects and problems, which will be

	relevant for the future work and interpretation of results achieved. 3) The lecture course is likely to address needs in the curriculum of physics students at the Latvian University.

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	*Name, surname, position, department* Janis Blahins, born: 16.05. 59 eng, Laborat.of atomic phys&photochem Aigars Rieba, born 20.06.58 eng, Labor.of atomic phys&photochem
Participant e-mail, m.ph.	*janis_59@inbox.lv +371-20042318* *aigi9@inbox.lv, +371-29221591*
Total expenses during trip	Travel costs for both together _~400 (apreciation in progress) LVL Janis Blahins 14 daysX150 EUR=2010 EUR Aigars Rieba 14 daysX150 EUR=2010 EUR
Receiving organization, hosting researcher, e-mail	Gothenburg University Physics Department (Sverige) Dag Hanstorp, f3adag@chalmers.se
Home institution	Laboratory of Atomic Physics, Atmosphere Physics and Photochemistry The Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia
Date of participation	From___04.08.2013.____ to ___17.08.2013.____
Aim of the visit	1)Participate in common experiments with PEARLS
Description of visit (in details)	We met Berkeley scientist Alexandro Aquilera and demonstrated how to work with our ion beam apparatus, how to make technical services about filament etc. Aigars Rieba very carefuly tested ion beam current stability and inert gas system, and vacuum systems stability needed for experiment. I helped with laser teodolite to adjust PEALS chamber to our beamline, and resulted that adjusting with much simpler ion current method at last visit we got mistake only 1mm too low and 1,5mm too left. That means an ion current is very precise indicator. Due we hadnt yet received ordered and payed precision inert gas regulation valve, Aigars decided to change inert gas system on near vacuum conditions operated small bottle, what allows to suffer valve problem. As a short time measure it is well made solution. Aquilera realized problem in our vacuum system what spreads in whole system oil fog and consequently oil film on all surfaces. As partial measure I found zeolite filter chamber what I made a fundamental washing and zeolite exchange (what was polluted). This chamber I installed between both our system turbopumps and their oil-based prevacuum pump. My only excuse is that I had pointed to this problem to Dag Hanstorp, but his opinion was that never in the past oil mist hadnt disturbed experiments. What is not true in this particular case with PEARLS. So, now our oil mist problem in high

	vacuum part is strongly minimized but not solved completely, and still is not solved in low vacuum sections. The beam defocusing making problem at our last visit was successfully repaired using the focusing Einzell lense after quadrupole and beam size was sufficient for reaction zone. After all Aquilera packed out the PEARLS parts, he realized that there are missing 9 identical power supplays needed for SJUTS channelotrons used in Pearls and one high voltage supply. I found three HV supplies in the cellar scrape, but only one had approprite small ripple voltage, yet there was need to test them all to get that knowledge. But about smaller voltage sources (100-250 Volt floating) after brainstorm discussion we concludeed that we ought to produce ourself, because to order it overflows the funding capabilities, and to produce similar devices is not very big job. Thus I researched the detail basis available for such devices, constructed an optimal circuitry and topology, and in collaboration with lab`s engineer Mats Rostedt machined an appropriate sample-and-hold plates, yet ordered components will be received in week time, what is outside my visit limits. Therefore physical soldering will be made by two Mexican doctorants with electronicist background whay was arriving in the day of our departure.
Results achieved	We get Aquilera accustomed with our machine, and get him certain help with planned experiment, so there is hope he will remember our wish for publications when his experiment will be concluded. However – would be very beneficially to plan shorter visit when PEARLS will be ready enough for enstart the experiment and it will be on the fly.
Reporting date	August 2013
Longterm feedback: conference thesis, publications, project initiatives etc. Upgrade (after each 4-12month)	Ought to come out (after a time) at least one very high level publication like world class inovative measurement method.
Upgrade date	January 2014

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	*Evan Hoffman, GFZ Potsdam*
Participants e-mail, m.ph.	
Total expenses during trip	1800 EUR
Receiving organization, hosting researcher, e-mail	Institute of Astronomy University of Latvia Kalvis Salmins, kalvis.salmins@lu.lv
Home institution	GFZ-Potsdam
Date of participation	From 19.08.2013 till 30.08.2013
Aim of the visit	Characterize existing time and frequency system and work out recomandations to improve existing time and frequency system at SLR station Riga also aiming for future space debris tracking and bistatic ranging mode.
Description of visit (in details)	Characterization of the old timing system including analysis of frequency standard quality. Identifed/removed surperflous/bad equipment. Documented,diagramed, and measured the timing system.
Results achieved	Assesment of the existing time and frequency system and it's setup at main laboratory building and at the telescope.
Reporting date	30.08.2013
Longterm feedback: conference thesis, publications, project initiatives etc.	Results reported on E.Hoffman, K.Salmins, J. Del Pino, A.Meijers "Modernization and Characterization of the Riga SLR Timing System" 19th International Workshop on Laser Ranging, Annapolis, October 27-31, 2014, Annapolis, US., http://ilrs.gsfc.nasa.gov/ilrw19/
Upgrade date	20.01.2015

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	*Saulius Bagdonas*
Participants e-mail, m.ph.	*saulius.bagdonas@ff.vu.lt*
Total expenses during trip	
Receiving organization, hosting researcher, e-mail	University of Latvia, Fotonika LV
Home institution	Vilnius University Physics Faculty, Department of Quantum Electronics
Date of participation	From 25.08.2013 till 01.09.2013
Aim of the visit	To give two lectures during the international conference Biophotonics –Riga 2013
Description of visit (in details)	The titles of the lectures were "Spectroscopy of Biological Tissues In Vivo" and "Spectrometry and Reflectometry of Biological Tissues for Diagnostic Purposes"
Results achieved	The lectures had been presented.
Reporting date	2015.01.22.

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Secondement visit report

Project Number	REG-POT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	Prof. Klaas Bergman, senior researcher, e-mail: bergmann@rhrk.uni-kl.de, +49 160 9664 5427
Total expenses during trip	Travel 239.84 EUR Secondment fee 4950.00 EUR
Receiving organization. Hosting researchers: Dr.Aigars Ekers Aigars.Ekers@lu.lv	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia
Home institution	Technische Universitaet Kaiserslautern, Fachbereich Physik
Date of participation	From 29.10.2013 – 30.11.2013
Aim of the visit	The main aim was teach a special course (10 lectures @ 90 minutes) on a timely topic on modern optics, photonics and quantum optics, anticipating an audience of master students and beginning graduate students. A further aim was to renew the contact with many research groups in Riga, in particular those, participating in the FOTONIKA project, to get up-to-date information of the scientific activities and possible links between groups.
Description of visit (in details)	(1) The lecture course was taught on Wednesday 12:30 – 14:10 and on Friday 14:30 – 16:10 from October 30 through November 29. The typical size of the audience was 25. The master students among them will take a written exam to earn credits for the completion of their study. The course introduced the students to modern concept of light-matter inter-action, using adiabatic (or dressed) states and discussing phenomena like coherent population return, the physics of the Mollow spectrum, the Autler-Townes effect, electromagnetically induced transparency, optically driven adiabatic passage, stimulated Raman adiabatic passage, Stark-chirped rapid adiabatic passage, etc., including the discussion of results of recent related experiments, partially from the researchers own work. – The researcher was available for discussions with the students, not only during the lecture and the break in-between but also at other times. (2) The researches visited several research groups and had extensive discussions about the on-going work both with the respective group leader and with other members of the group. This involved the groups of Dr. Aigars Ekers (Oct. 30, Nov. 6 and casually at other occasions), Prof. Janis Spigulis (Nov.5), Prof. Ruvin Ferber (Nov. 7), Prof. Arnolds Uebelis (Nov.8), Dr. Vyacheslavs Kashcheyevs (Nov. 13), Prof. Iamants Berson (Nov. 15), Dr. Janis Alnis (Nov. 27), and Dr. Florian Gahbauer (Oct. 30 and Nov. 20).

	(3) The researcher had a number of discussions on science politics trying to identify problems which he could possible help reduce or overcome. This included an extensive discussion of management issues related to the FOTONIKA project with Dr. Uebelis and Dr. Ekers on Oct. 31, a discussion about future possible research proposals (including those to be submitted to the ERC) with Dr. Uebelis and Dr. Bersons on Nov. 15, a discussion with the rector of the Latvian University, Prof. Marcis Auzinsh on general science policy (and reducing oversized burocracy) on Nov.21. (4) The researchers also participated in the reporting meeting on EU FP7 IRSES projects at the occasion of the visit of Dr. Dacquino and Dr. Mikita from the EU in Brussels. He participated in the discussions (on Nov. 21 and 22). (5) Throughout the secondment period, the researcher did engage in several detailed discussions with students (mainly Martins Bruvelis) and other visiting researchers (mainly Prof. Nikolai Bezuglov, St. Petersburg) about results – partially yet unexplained – from a cooperation with Taiwan (pheonomena observed in magneto-optical atom traps) and reviewed a related manuscript. Prof. Bezuglov presented some new ideas about experiments, to be done at Riga, using the method of stimulated Raman adiabatic passage.
Results achieved	The lecture course was completed. Several scientific issues were clarified. Extensive advice was offered on general pertinent issues of science, science planning and local science politics
Date of the first reporting	November 2013
Longterm feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 6-12 month)	Several students are expected to take (and pass) the exam related to the lecture course on January 22, with feedback given to the students within the same week – including the discussion of main mistakes or misconceptions and of the correct results. The results from the various discussions are expected to have a positive impact on how FOTONIKA science develops in the future and how the project is managed.

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant	*Kalvis Salmiņš, Institute of Astronomy*
Total expenses during trip	_____LVL _____2250_____ EUR
Receiving organization	GFZ Helmholtz Centre Potsdam, Dr. L.Grunwaldt, grun@gfz-potsdam.de
Home institution	Institute of Astronomy University of Latvia
Date of participation	From_____18.10.2013____ to ____01.11.2013____
Aim of the visit	Work and satellite laser ranging data post processing methods
Description of visit (in details)	Finished modifications in SLR data processing software and results compared with previous algorithm to determine systematics if any. Meeting with A.Kloth from SpaceTech Gmbh about possibility to upgrade SLR station Riga, in particular about using SLR station tracking software developed at SpaceTech. Meeting with Dr. R.Neubert from GFZ Potsdam and discussion about influence of satellite retroreflector arrays to data processing and a ways to deel with it, including center of mass correction.
Results achieved	Agreement with A.Kloth from SpaceTech Gmbh about visit in Riga SLR station future joint developments in SLR technology. SLR data processing software upgraded to better handle marginal cases including combined pass processing which often manifests as numerical stability problems during orbital fitting. Introduced optional CoM (Center of Mass) correction in data processing algorithms.

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Secondement visit report

Project Number	REG-POT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	Prof. Klaas Bergman, senior researcher, e-mail: bergmann@rhrk.uni-kl.de, +49 160 9664 5427
Total expenses during trip	Travel 239.84 EUR Secondment fee 4950.00 EUR
Receiving organization. Hosting researchers: Dr.Aigars Ekers Aigars.Ekers@lu.lv	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia
Home institution	Technische Universitaet Kaiserslautern, Fachbereich Physik
Date of participation	From 21.01.2014 till 25.01.2014
Aim of the visit	Written exam
Description of visit (in details)	Scientific discussions, giving the written exam related to the lecture course (Nov. 2013), grading the exam and discussing the outcome with the students.
Results achieved	Most, but not all, of the 25 students taking the exam did Passed it.
Reporting date	19.January 2015
Longterm feedback: conference thesis, publications, project initiatives etc.	Education in a modern topic of optics and quantum optics
Upgrade date	19.January 2015

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	*Mark H Stockett*
Participants e-mail, m.ph.	*Mark.Stockett@fysik.su.se*
Total expenses during trip	€450
Receiving organization, hosting researcher, e-mail	University of Latvia - FOTONIKA LV Uldis Berzinsh uberzinsh@gmail.com
Home institution	Stockholm University Department of Physics
Date of participation	From 06.02.2014 till 08.02.2014
Aim of the visit	Participation in Annual Scientific conference of the University of Latvia
Description of visit (in details)	06.02 Arrived in Riga, visites FOTONIKA institute and met with staff 07.02 Attended conference 08.02 Departed Riga
Results achieved	Delivered invited talk Networking
Reporting date	16.01.2015
Longterm feedback: conference thesis, publications, project initiatives etc.	Ongoing elationship with repatriated scientist Dr.U.Berzins.

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant	*Kalvis Salmiņš, Institute of Astronomy*
Total expenses during trip	_____LVL _____2550_____ EUR
Receiving organization	GFZ Helmholtz Centre Potsdam, Dr. L.Grunwaldt, grun@gfz-potsdam.de
Home institution	Institute of Astronomy University of Latvia
Date of participation	From_____12.02.2014____ to ____28.02.2014____
Aim of the visit	Work and satellite laser ranging data post processing methods and prepare for experiments with time standard comparisons
Description of visit (in details)	Implemented orthogonal polynomial fitting in SLR data processing software allowing to process ranging data from dysfunctional(lost or damaged attitude control, mission completed,..) satellites like Envisat, Topex-Poseidon and similar objects. Meeting with E.Hoffman from GFZ-Potsdam to arrange experiments to compare SecureSync GPS steered Rb standards with Agilent 5073 Cs Primary time standard to evaluate their performance, preparation for publication on upcoming SLR workshop.
Results achieved	Arranged time and frequency standard comparison experiment, SLR data postprocessing software now capable to handle data from tumbling satellites like Envisat, work on joint paper for upcoming ILRS workshop.

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	*Evan Hoffman, GFZ Potsdam*
Participants e-mail, m.ph.	
Total expenses during trip	1650 EUR
Receiving organization, hosting researcher, e-mail	Institute of Astronomy University of Latvia Kalvis Salmins, kalvis.salmins@lu.lv
Home institution	GFZ-Potsdam
Date of participation	From 12.03.2014 till 27.03.2014
Aim of the visit	Evaluate new time and frequency system, it's stability and options to transfer frequency and time between laboratory and telescope building, help to prepare introduce fiber optics for thefrequency transfer, prepare comparision with cesium primary time and frequency source.
Description of visit (in details)	Preliminary evaluating of the new SecureSync 1200-033 GPS steered Rb unit, setting it as a replacement for the old system , testing and comparing it with previous Rb units, performed experiments on different modes of time transfer for stability. Performed temperature stability test on cables.
Results achieved	First results of the new system performance, temperature stability estimation. Showed stability issues with IRIG-B timing signal delivery. Gave repeatable cable meas.
Reporting date	30.03.2014
Longterm feedback: conference thesis, publications, project initiatives etc.	Results reported on E.Hoffmam, K.Salmins, J. Del Pino, A.Meijers "Modernization and Characterization of the Riga SLR Timing System" 19th International Workshop on Laser Ranging, Annapolis, October 27-31, 2014, Annapolis, US., http://ilrs.gsfc.nasa.gov/ilrw19/
Upgrade date	20.01.2015

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	Prof. Dr.-Ing. **Eimuntas Kazimieras Parseliunas**
Participants e-mail, m.ph.	Eimuntas Kazimieras Paršeliūnas <Eimuntas.Parseliunas@vgtu.lt>
Total expenses during trip	
Receiving organization, hosting researcher, e-mail	Institute of Geodesy and Geoinformatics, University of Latvia Janis.balodis@lu.lv
Home institution	Vilnius Gediminas University Faculty of Environmental Engineering
Date of participation	10.04.2014. – 07.05.2014
Aim of the visit	Discussion on the eventual co-operation in development of the project submissionm for H2020. Exchange of the ideas and experience in remote sensing and on the GNSS applications. National geoid improvement for Latvia
Description of visit (in details)	Lecture on the research at the Vilnius Gediminas Unversity. Common work on thetheoretical studies of Bernese software v.5.2. Discussion on the Bernese software application results in observation reduction of LatPos and EUPOS-Riga. Discussions on the eventual co-operation in remote sensing within the famework of Copernicus programme. Dscussions on the Sentinel missions.
Results achieved	2 lectures on the research achievements of Faculty of Environmental Engineering of Vilnius Gediminas university. 5 seminars.
Reporting date	5.05.2014.
Longterm feedback: conference thesis, publications, project initiatives etc.	Project initiatives
Upgrade date	15.12.2014

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	Sandra Smalina
Participants e-mail, m.ph.	sandra.smalina@gmail.com
Total expenses during trip	1534 EUR
Receiving organization, hosting researcher, e-mail	Fraunhofer Institute of System research and Innvation (ISI), Karlsruhe, Germany, Ewa Donitz, Ewa.Doenitz@isi.fraunhofer.de
Home institution	University of Latvia, Institute of Athomphysics and spectroscopy.
Date of participation	04.05.2014. till 19.05.2014.
Aim of the visit	
Description of visit (in details)	During secondment visit in Fraunhofer Institute of Systems and Innvocations Research ISI with assistance of Dr. Ewa Donitz methodology of long-term visions Developed and road map development through Forsight approach was studied. During visit strategy development, complex systems analysis, literature has been studied. Discussions with the staff of the Institute of Photonics methodology, strategy and Roadmap (Roadmap) development for the Photonics industry were held. As one of most important aprauches for Forsight metodology usage is Expert workshops, during wich with creative methodology "roadmap" for indutry is created. During Secndment trip there were possibility to participate in Expert workshop for project "Railway 2050"
Results achieved	It was very useful to learn the latest approach and calculation methods, as well as to establish new contacts. Experience gained will be used to develop foresight exercise in FOTONIKA LV
Reporting date	May 2014
Longterm feedback: conference thesis, publications, project initiatives etc.	Publication: S.Smalina "Foresight studies for photonic industry in Latvia - project FOTONIKA-LV foresight workshops" 72nd annual scientific conference of University of Latvia NATURAL SCIENCES PHOTONICS

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	*Evan Hoffman, GFZ Potsdam*
Participants e-mail, m.ph.	
Total expenses during trip	1950 EUR
Receiving organization, hosting researcher, e-mail	Institute of Astronomy University of Latvia Kalvis Salmins, kalvis.salmins@lu.lv
Home institution	GFZ-Potsdam
Date of participation	From 27.07.2014 till 08.08.2014
Aim of the visit	Analysis of the results of comparision with the Agilent 5073 Cs time and frequency source, preparation for second SecureSync unit test, preparation for the joint ILRS workshop report.
Description of visit (in details)	First results of comparision with Agilent 5073 CS analyzed, detected 5ns 1 PPS phase ocsillation , preparing for the test for the second SecureSync unit, additional performance and temperature stability measurements. Performed summer temperature stability analysis.
Results achieved	Detected 5ns anomaly in 1pps output for both SecureSync units, anomaly reported to manafacturer, new time and frequency system setup finalization at SLR station Riga.
Reporting date	30.08.2014
Longterm feedback: conference thesis, publications, project initiatives etc.	Results reported on E.Hoffmam, K.Salmins, J. Del Pino, A.Meijers "Modernization and Characterization of the Riga SLR Timing System" 19th International Workshop on Laser Ranging, Annapolis, October 27-31, 2014, Annapolis, US., http://ilrs.gsfc.nasa.gov/ilrw19/
Upgrade date	20.01.2015

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant	*Kalvis Salmiņš, Institute of Astronomy*
Total expenses during trip	_____LVL _____1500_____ EUR
Receiving organization	GFZ Helmholtz Centre Potsdam, Dr. L.Grunwaldt, grun@gfz-potsdam.de
Home institution	Institute of Astronomy University of Latvia
Date of participation	From_____02.12.2014____ to ____11.12.2014____
Aim of the visit	Work and satellite laser ranging data post processing methods and prepare for experiments with time standard comparisions
Description of visit (in details)	Meeting with A.Kloth and J. Steinbook from SpaceTech Gmbh and discussion about integrating space debris tracking support in SLR station software and about possibility to participate in Horizon2020 projecys together with GFZ Potsdam and other parties. Prepared upcoming experiments with calibration of absolute pressure sensors.
Results achieved	Achieved agreement about preparation of proposals for Horizon2020 project calls in 2015, prepared experiments with absolute pressure sensor calibration involving portable standard and comparision of pressure sensors in SLR stations in Riga and Kiev, Ukraina

Annex 3: Individual reporting of exchange participants of two way secondments between the FOTOIKA LV research community at the University and marked or emerging partnerships in the EU and beyond

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	Dr. Teodora Velcheva Kirova , born-07.02.1974, researcher: teo@lu.lv, (+371)-205-704-54
Total expenses during trip	Secondment fee -25200 EUR
Receiving organization. Hosting researchers:	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia Dr.Aigars Ekers, Aigars.Ekers@lu.lv
Home institution	National Institute for Theoretical Physics, South Africa
Date of participation	From 10.04.2012. – 09.10.2012.
Aim of the visit	The aim of the visit was to bring competence in the theory of interactions of atoms and molecules with strong coherent light fields and cold molecules research and to perform theoretical calculations of Autler-Townes spectra in multilevel atomic systems interacting with multiple laser fields.
Description of visit (in details)	The visiting researcher was fully integrated in the team and current research activities of the hosting laboratory. She performed extensive theoretical simulations of the Autler-Townes spectra upon interaction of strong coherent light fields with hyperfine level systems of Na atoms.
Results achieved	New insights on the occurrence of dark states in strongly coupled hyperfine level systems were obtained. Comparison of theoretical simulations with the experimental results provided important information on improvements in the running experiments. The objective of these experiments is to resolve the laser-dressed states that result from initially unresolved hyperfine level systems subjected to strong laser coupling. The work resulted in a number of conference abstracts and a draft manuscript that is being finalized for publication.
Date of the first reporting	October 2012
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 6-12 month)	The work resulted in five conference abstracts and a manuscript in preparation for Phys. Rev. A. Other long term outcomes include a follow-up FP7 Reintegration Grant proposal (FP7-PEOPLE-2013-CIG LaMEITRA) rated above threshold (76.6 points) but not retained for funding, and the second follow-up FP7 proposal (FP7-PEOPLE-2013-IOF RYDEIT) still in evaluation.
Upgrade date	July 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.ph.	*Dr. Ilgmars Eglitis, leading researcher, born:* 04.04.51, *Ilgmars@latnet.lv,*
Total expenses during trip	_____LVL _____4650_____ EUR
Receiving organization. Hosting researchers, e-mails	*Moletai Observatory Institute of Theoretical Physics and Astronomy Vilnius University, http://mao.tfai.vu.lt/mao/en*, +370 383 45 444 Dr. Grazina Tautvaisiene, Grazina.Tautvaisiene@tfai.vu.lt
Home institution	*Astronomy observatory, Institute of Astronomy, Association FOTONIKA-LV, University of Latvia*
Date of participation	From___14.05.2012.__ to __13.06.2012.____
Aim of the visit	Acquire and develop weak image processing methods.
Description of visit (in details)	Arrival to MO 14.05.2012. Introduction to observation methodology with the Maksutov telescope of MO 15.05.2012.-21.05.2012. Training to work with "Astrometric ' program 22.05.2012.-02.06.2012. Work on the improvement of observation methodology of faint asteroids 03.06.2012-06.06.2012. Consultation and advice on the improvement of Schmidt telescope operating system 07.06.2012. Introduction of astronomers of MO with astronomical research in Institute of Astronomy of University of Latvia 08.06.2012. The discussion of joint research opportunities, to including spectral observation with Schmidt telescope in interstellar absorption studies. 09.06.2012.-12.06.2012. Return to Riga 13.06.2012.
Results achieved	The observation methodology with Maksutov type 51 cm wide angle telescope of Observatory was mastered. Observation methodology training was held in cooperation with the principal investigator Dr. Vygandas Laugalys (ITPA). Telescope is used for the photometry in eight color Vilnius photometric system and for detections of asteroids and comets. Stellar radial velocity measurement hardware "Caravel" that mounted on a MO 1.65 m telescope was viewed. Learned to work with the program ' Astrometric ', which is used for detection of moving objects and its coordinates on astronomical

	plates The cooperation between ITPA and Institute of Astronomy of Latvia in research of small objects of solar system was expanded. Together with Dr Kazimieras Černis (ITPA) were developed the methodology of observations of weak object with a Schmidt telescope. Agreement was reached with Dr. Rimas Jakulis (ITPA) to help improve the operating system of Baldone Schmidt telescope. Agreement was reached with Dr.Vygandas Laugalys and Prof. Vytautas Straižys (ITPA) on cooperation in the studies of interstellar absorption in selected areas of the sky with a help of Baldone spectral observations.
Reporting date	June 2012
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 4 -12 month)	1) The results of during secondement visit lessons learned together with the scientific work of the previous year are reflected: ➢ in the poster by I.Eglītis, M.Eglīte „New Carbon Stars in Region $\delta > 60^{o}$”, which was presented in the conference "17th Cambridge Workshop on Cool Stars, Stellar Systems and the Sun" ➢ in the poster Barselona, Spain 22.06.-01.07.2012 ➢ in the conference "The Zeiss-50” telescope: the first hundred years working for astronomy" Ukraine, Nauchny, Crimean AO, 9.09.-13.09.2012. 2) The publication by I.Eglitis "120 cm Baldone Ceiss telescope" is prepared for the journal "Исследования КрАО", Ukraine, Crimean AO.
Upgrade date:	July 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA-LV
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	Electronic Engineer Mr. Aleksandrs Švarcs, e-mail: shvarcs@lu.lv m.phone: +371 29763325
Total expenses during trip	Travel costs Secondment fee 2100 EUR
Receiving organization. Hosting researchers, e-mails	St.Petersburge State University, Physical faculty, Department of Optics and Spectroscopy http://optics.phys.spbu.ru/ Prof. Andrey N. Klyucharev, e-mail: anklyuch@gmail.com
Home institution	Association FOTONIKA-LV
Date of participation	From 16.06.2012. – 29.06.2012
Aim of the visit	Development of expertise and experimental skills in operating and building crossed supersonic molecular beams with electron beams and laser radiation at Physics Department of the St.Petersburg University.
Description of visit (in details)	During the visit, the seconded electronic engineer acquired skills and expertise in various aspects of operating, maintaining and developing pulsed supersonic molecular beams crossed with electron beam and excited with tunable femtosecond laser complex (from Quantel). Specifically, operation, maintenance, and computer control of the following laboratory equipment was studied: tunable femtosecond laser (France, Amplitude Technology): 220-1500 nm, pulse~ 40 fs, energy till 10 mJ; tunable nanosecond laser (France, Quantel): 220-800 nm, pulse duration 10 ns, pulse energy 10 mJ, photoelectron time-of-flight (TOF) spectrometer 7003 MBES III (UHV version), TDS spectrometer (TDS 40A1) and electron gun.
Results achieved	New expertise and skills were developed in operating and building supersonic molecular beam apparatus, and in operating, maintain, and controlling laser systems.
Date of the reporting	July 2012
Longterm feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 6 -12 month	The results are not published since they constitute technical skills and knowledge. The acquired skills and knowledge are being applied for designing and preparing experiments with supersonic Na molecular beam upon excitation by tunable laser sources with computer control of laser frequency. The expertise of the researcher was further refined in a repeated visit to St. Petersburg University in June 2013.
Upgrade date	22.07.2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant	*Dr. Edgars Kviesis-Kipge, researcher, born:* 11.06.82 cobba@inbox.lv
Participants e-mail, m.ph.	cobba@inbox.lv
Total expenses during trip	4050 EUR
Receiving organization. Hosting researchers, e-mails	University of Oulu, Optoelectronics And Measurement Techniques Laboratory. matti.kinnunen@ee.oulu.fi
Home institution	Biophotonics Laboratory, Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV
Date of participation	From 30.07.2012 to 25.08.2012
Aim of the visit	Scientific cooperation in EU FP7 project. Scientific research at the Optoelectronics and Measurement equipment laboratory, University of Oulu according to the scientific tasks of the project, to develop wireless PPG (photoplethysmography) technologies and make research measurements in biophotonics area.
Description of visit (in details)	Working with the literature on wireless transmission systems SpO_2 (pulse oximetry) and equipment. Practical work with SpO_2, PPG, ECG equipment improvement and testing and programming of Bluetooth wireless transmission module. Created a simplified version of a software algorithm that demonstrates the full operation of the device. Studied the circuit of programming module and literature, searched for solution to solve potential data communication problems that related to reliable operation of the equipment. Work in the laboratory of electronics. Obtained information about Oulu University Optoelectronics and Electronics laboratory equipment. A lot of work with the literature on the PPG and SpO_2 sensors and parameter extraction from various human body parts (head and neck). Work in the laboratory at the digital wireless "head bandage" circuit study, refinement and transformation. Improvement of existing software, and testing, as well as additional functionality development. Programming of new software modules. Explored SpO_2 & PPG electronic circuits and built-in Chipox pulse oximetry sensor and module. Studied literature about Chipox programming module and a

	ARM microcontrollers. Studied and improved existing software.
Results achieved	Significantly improved telemedicine 'forehead bandage "electronics circuit and Bluetooth wireless transmission module's software. Developed software that demonstrates the full operation of the device and pulse oximetry measurements obtained from a finger and ear sensor.
Reporting date	August 2012
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 4 month)	Not yet
Upgrade date	23.08.2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.ph.	*Janis Spigulis, Leading Researcher, IAPS Biophotonics Laboratory. Janis.spigulis@lu.lv, +371 29485347*
Total expenses during trip	Travel 300_LVL _____2850_____ EUR
Receiving organization. Receiving researchers, e-mail	International Laser Centre, Moscow Lomonosov State University; Alexander Priezzhev, avp2@phys.msu.ru
Home institution	Laboratory of Biophotonics, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia
Date of participation	From10/09/2012 to 5/10/2012, except 16-23/09
Aim of the visit	Joint studies and discussions on new projects in biophotonics
Description of visit (in details)	Week 1: Accommodation, acquaintance with ILC, visits to departments of MSU, presentation at scientific seminar of ILC on 14/09 at 3pm (topic: "Developments of optical/laser technologies for healthcare at University of Latvia"). Week 2: Participation at the conference SFM-2012 and International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics, September 25-28; presentation of a plenary lecture "Optical diagnostic techniques for dermatology and cardiology: from lab to clinic" on 25/09, attendance of other sessions and discussions with international participants. Week 3: Joint studies of literature materials and experimental data related to optical diagnostics of vascular diseases (diabetics and sepsis). Evaluation of potential of the combined blood rheology studies with online capillaroscopy and photoplethysmography techniques for early diagnostics of these diseases. Development of a backbone for future joint project application.
Results achieved	1. Research methods and model devices developed at the Biophotonics laboratory have been disseminated among partners of the FOTONIKA-LV project. 2. Bio-optical methodologies and techniques used at Moscow University and Institute of Applied Physics have been acquired. 3. The concept of future joint project aiming at early diagnostics of diabetic and sepsis has been elaborated.

Reporting date	October 2012
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 4 month)	Conference thesis: J.Spigulis. Joint research activities with Moscow State University Laser Centre. 71st annual scientific conference of University of Latvia, Book of Abstracts, p.32 (2013) J.Spigulis (invited). Laser-excited skin photo-bleaching effects. LAT 2013 (Int. Conf. on Lasers, Applications and Technologies), Moscow, 19 June 2013; Abstracts, p.60. Joint project proposal aiming at early diagnostics of diabetic and sepsis was prepared for 90%, application will be submitted at first possibility.
Upgrade date	21/08/2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA-LV
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, phone.	*Arnolds Ūbelis, Lead researcher, Institute of Atomic Physics and Spectroscopy, University of Latvia.* *Project Coordinator: Arnolds@latnet.lv, +37129498659*
Expenses during trip	150 EUR x 8 day = 1200 EUR
Receiving organization. Hosting researchers, e-mails	Austrian Institute of Technology, http://www.ait.ac.at/ Dr. Walangitang Daiva: Daiva.Walangitang@ait.ac.at Dr. Giesecke Susanne: Susanne.Giesecke@ait.ac.at,
Home institution	Association FOTONIKA-LV
Date of participation	From 24.09.2012 to 01.10.2013
Aim of the visit	Research training and training in foresight methodology.
Description of visit (in details)	During the visit I had one day visit to the Sustainable Building Technologies division hosted by dr. Walangitang Daiva where we discussed the content of in the proceedings book of the conference: 3rd International Conference on Integrative Approaches towards Sustainability: – "Sustainable development, knowledge society and smart future manufacturing technologies – KNOWLEDGE" raised by the project REGPOT -CT-2011-285912-FOTONIKA. Besides there were working visit to the demonstrations site of renewable energy sources for sustainable buildings. Afterwards I was busy with contacts at the Department of Innovation and in particular with colleagues dealing with Foresight Processes & Governance. Final part of the visit was participation in the event organized by: European Foresight Platform supporting forward looking decision making www.foresight-platform.eu The EFP Final Event "Forward Looking Activities Governing Grand Challenges" was organized in Vienna, September 27 and 28, 2013. The event was excellent opportunity for comprehensive insight in foresight activities in EU and around in the world: http://www.millennia2015.org/files/files/Publications/programm_efp_final_event_einladung_v12.pdf Final two days of the visit were used for participation in "AIT Foresight Training on Delphi".

Results achieved	The visit was opportunity to be trained on foresight issues in the context of technology foresight activities planned in the corporate part of the project REGPOT-CT-2011-285912-FOTONIKA-LV.
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 4 month)	Long-term outcome of the visit: Partnership in the FP7-PEOPLES-IRSES-2011 project International Foresight Academy – IFA, Grant.nr. 294959. Up to now informal and there is an option – Association FOTONIKA-LV is replacing the partner from Manchester leaving the consortia.
Upgrade date	01.07.2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant	Inese Janpaule, researcher, University of Latvia, Institute of Geodesy and Geoinformation
Total expenses during trip	174.23 LVL 9300 EUR
Receiving organization	Karlsruhe University of Applied Sciences, Institute of Geomatics and Fraunhofer Institute for Systems and Innovation Research ISI
Home institution	University of Latvia, Institute of Geodesy and Geoinformation
Date of participation	From 20.10.2012. to 20.12.2012.
Aim of the visit	Working with geoid computation software DFHRS 4.0 under the supervision of Prof. Dr.-Ing. Reiner Jäger. Attending DFHRS 4.0 courses. Experimental geoid computation, using available gravimetric and GNSS/levelling data. Scientific cooperation within ES FP-7 FOTONIKA-LV project with Fraunhofer Institute for Systems and Innovation Research ISI.
Description of visit (in details)	During the visit in Karlsruhe University of Applied Sciences, Institute of Geomatics deep study of DFHRS 4.0 software was done by experimental geoid height reference surface computations for Germany and Latvia regions using different global gravity field models and GNSS/levelling data sets. Several global gravity field models were evaluated by transforming them to Latvian height system and comparing them with Latvian national geoid model LV'98. Three presentations in Karlsruhe University of Applied Sciences, Institute of Geomatics were made to report the achieved results. Two day visit in Fraunhofer Institute for Systems and Innovation Research ISI was made. Secondee was introduced with work structure of institute and basic principles of "foresight" and "scenarios" strategic planning methods.
Results achieved	Geoid height reference surface for Latvia of RMS 1.6 cm was obtained using DFHRS software. Obtained surface was evaluated using LV'98, GNSS/levelling and global gravity field model data. Results are shown in publication, cited in Scopus data base: Janpaule, I.; Jäger, R.; Younis, G.; Kaminskis, J.; Zariņš, A. 2013. Dfhrs-based computation of quasi-geoid of Latvia, *Geodesy and Cartography* 39(1): 11–17.

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA-LV
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	*Roman Viter, Visiting researcher, Institute of Atomic Physics and Spectroscopy, University of Latvia.* *Viter_r@mail.ru,*
Total expenses during trip	Travel costs 182 EUR + 136.24 LVL 150 EUR x 8 day = 1200 EUR
Receiving organization. Hosting researchers, e-mails	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE European Institutes of Membranes *(www.iemm.univ-montp2.fr), Montpellier, France* Dr. Mikhael Bechelany mikhael.bechelany@univ-montp2.fr
Home institution	ODESSA NATIONAL I.I. MECHNIKOV UNIVERSITY, Odessa, Ukraine
Date of participation	From 3.11.2012 to 10.11.2012
Aim of the visit	Research and preparation of EU funded projects.
Description of visit (in details)	During the visit, structural properties of TiO_2 and ZnO nanostructures have been investigated with Raman spectroscopy. Mechanisms of immobilization of biological samples on ZnO surfaces were studied by means of confocal microscopy (Montpellier). Interaction of antigens and antibodies on ZnO surface has been demonstrated. Preparation of two international projects was continued. One project (FP7-PEOPLE-2013-ITN Proposal number: 607534 Proposal acronym: METONANOSENS) was finalized and submitted. The second project was developed and submitted in January 2013 (FP7-PEOPLE-2013-ITN Proposal number: 607534 Proposal acronym: METONANOSENS). Drafts of papers and conference abstracts were prepared.
Results achieved	**Two projects were submitted:** FP7-PEOPLE-2013-IAPP Proposal No. 612325 Acronym: METOXNANOBIO FP7-PEOPLE-2013-ITN Proposal number: 607534 Proposal acronym: METONANOSENS **Conference abstract and paper were completed:** Roman Viter, Valentyn Smyntyna, et al., ZnO Nanorods Room Temperature Photoluminescence Biosensors For Salmonella Detection // Technical Digest Frontiers in Optics (FiO) 2012 and Laser Science (LS) XXVIII Meetings. (Optical Society of America, Washington, DC, 2012),

	FW3A.61.
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 4 month)	**Longterm outcome of the visit:** **New publication was accepted.** I. Mihailova, V. Gerbreders, E. Tamanis, E. Sledevskis, R. Viter, P. Sarajev, Synthesis of ZnO nanoneedles by thermal oxidation of Zn thin films, Journal of Non-Crystalline Solids, In Press, Corrected Proof, Available online 10 June 2013 **New abstract was accepted:** Atomic layer deposition for solar cells and Hydrogen purification applications Adib Abou Chaaya, Mikhael Bechelany, R. Viter, A. Zalesskaya, K. Kovalevskis and V.Smyntyna, Philipe Miele, EMRS 2013, Strasbourg, France **BSc project was done:** Kristaps Kovalevskis, 'Optical and structural properties of ALD deposited ZnO nanostructures'
Upgrade date	22.08.2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	*Kaspars Miculis, researcher, e-mail: michulis@latnet.lv*
Total expenses during trip	1826 LVL 2598 EUR
Receiving organization Hosting researchers, e-mails	St. Petersburg State University, Faculty of Physics, Hosting researcher Prof. Nikolay Bezuglov, e-mail: bezuglov@physik.uni-kl.de
Home institution	University of Latvia, Faculty of Physics and Mathematics, Laser Centre
Date of participation	From 07.12.2012 to 21.12.2012
Aim of the visit	Collaboration with scientists of the hosting organization on theoretical calculations on quantum manipulation of light and matter.
Description of visit (in details)	During the visit, knowledge was exchanged on application of the split propagation technique to the solution of density matrix equations of motion. Joint work was performed on writing the first draft of the manuscript entitled "Study of Multiple Dark and Bright States Formation in Hyperfine Levels of Na via Autler-Townes Effect".
Reporting date	December 2012
Long-term feedback: Conf. thesis, publications, project initiatives, etc. Upgrade (after each 4-12 month)	Two joint conference abstracts with scientists from St. Petersburg university resulted. Work on the joint manuscript is being continued.
Upgrade date	July 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	Researcher Dr. Yi-Hsin Chen, born: 20.09.1982, e-mail: d9622819@oz.nthu.edu.tw
Total expenses during trip	Travel 6541 TWD Secondment allowance -3450 EUR
Receiving organization. Hosting researchers:	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia Dr.Aigars Ekers, Aigars.Ekers@lu.lv
Home institution	Ultracold Atom Laboratory, National Tsing Hua University, Department of Physics Hsinchu, Taiwan, R.O.C. 30043 http://atomcool.phys.nthu.edu.tw/
Date of participation	From 02.03.2013 - 18.03.2013 and 25.03.2013 - 30.03.2013.
Aim of the visit	The purpose of the secondment was to carry out transfer of knowledge activities in the area of laser cooling of Rb atoms. More specifically, the researcher assisted and instructed the staff of Dr. Ekers group in building a magneto-optical trap enabling cooling a cloud of Rb atoms from the room temperature to about 300 microkelvin.
Description of visit (in details)	During the visit the seconded researcher provided information and instructions about various aspects and parameters of Rb magneto-optical laser cooling system, including knowledge of what experimental parameters have been successful in previous studies. The researcher provided detailed information on (1) laser cooling system parameters such as master and repump laser frequency, line-width, detuning, power, beam size, beam shape and their influence on the number and temperature of captured atoms; (2) magnetic system parameters such as quadrupole and compensation coils for field gradient required for capturing cold atoms; (3) vacuum system parameters and workable versions of vacuum system design; (4) methods allowing the determination of various MOT parameters, such as the determination of temperature using a CCD camera and determination of atom number in a trapped atom cloud.
Results achieved	Transfer of knowledge was carried out, providing information about

	most important Rb MOT parameters. Improved various aspects of Rb MOT setup design that resolved some unforeseen operational issues, increased MOT operation time and reduced the maintenance of MOT setup.
Date of the first reporting	March 2013
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 6-12 month)	The long-term goal beyond the duration of this visit is to achieve a substantial improvement of spectral resolution of interference structures in the Autler Townes spectra of hyperfine level systems. Further plans include advancing the laser cooling setup to producing ultracold Rb_2 molecules and studying the prospects of ultracold chemistry.
Upgrade date	August 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, phone.	*Aleksejs Ļihačovs, leading researcherBorn:, Aleksejs.Lihacovs@lu.lv,*
Total expenses during trip	____4650_____ EUR
Receiving organization. Hosting researchers, e-mails	Vilnius University, Laser Research Center, Biophotonics group http://www.lasercenter.vu.lt/?lang=en http://www.biofotonika.ff.vu.lt/biophotonics/index.html Ricardas Rotomskis - ricardas.rotomskis@ff.vu.lt
Home institution	Laboratory of Biophotonics, The Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia
Date of participation	From_____01.05.2013_____ to ___31.05.2013_____
Aim of the visit	Studying of the basics principles of fluorescence time-resolved spectroscopy techniques and its application in bio-photonics.
Description of visit (in details)	The main task of training is time resolved investigation of skin endogenous and exogenous fluorophores during continuous laser excitation. It includes following sub-tasks: 1. Assembling and testing of a point monitoring fluorescence lifetime (FLT) system. 2. Investigation of possible impact of fiber optic probe on FLT results. 3. In-vitro and in-vivo measurements, data collection and analysis. 4. Parallel in-vivo photobleaching and fluorescence lifetime measurements, data collection and analysis. **Work description and main results**

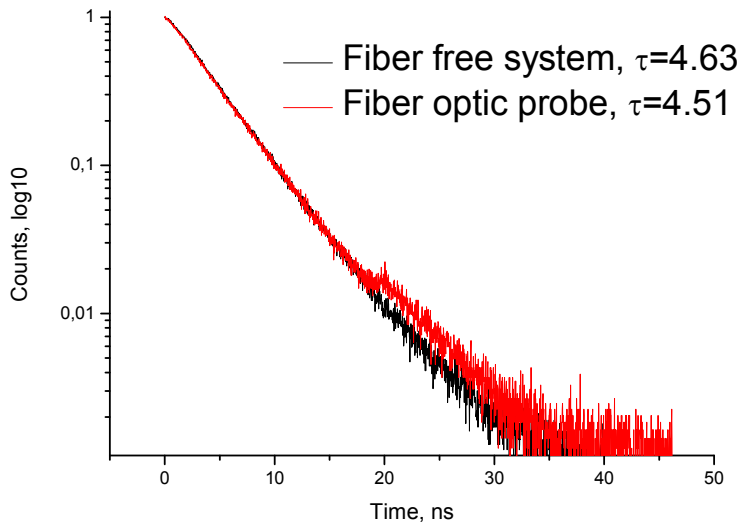

Fig.1. The effect of fiber optic probe on Chlorine e6 FLT kinetics.

Figure 1 illustrates the impact of fiber optic probe on the Chlorine e6 FLT kinetics. The impact of fiber optic probe manifested as some artifacts at 20 - 25 ns. These artifacts caused by light multiple scattering and reflections inside the fiber. Approximate impact on the FLT is not more than 3% that is quite reasonable.

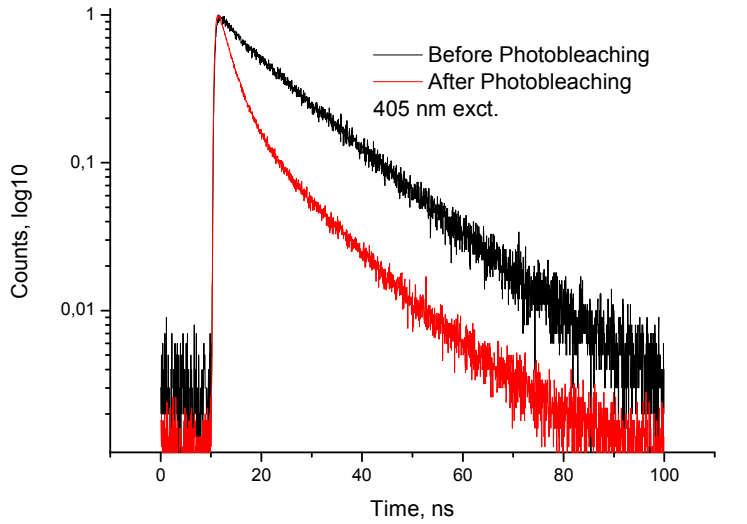

Fig.2. Florescence lifetime kinetics of protoporphyrin IX diluted in BSA before and after photobleaching.

Protoporphyrin IX - BSA solution fluorescence lifetime changes after photobleaching is presented in figure 2. The solution was irradiated by 532 nm continuous laser during 10 minutes, with power density 50 mW/cm^2. As shown in figure, after photobleaching the kinetics undergoes the serious changes, respectively, appears additional decay component. The appearance of additional component indicates on changes in fluorophore composition changes. In this case, during the photobleaching new fluorophore was produced.

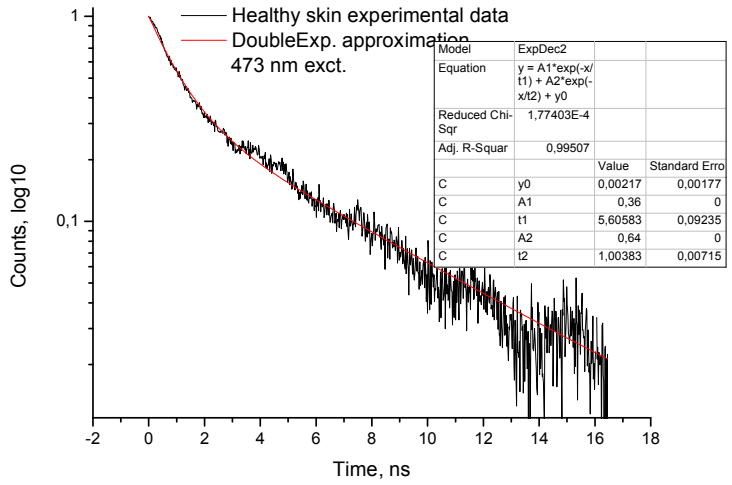

Fig.3. *In-vivo* healthy skin autofluorescence lifetime kinetics and it double exponential approximation.

In figure 3 is shown the first in-vivo FLT results. Kinetics was approximated by double exponential decay function. The fast component is τ_1= 1 ns, slow component τ_2=5.6 ns. These results quite good correlate with the literature data. Obtained result demonstrates the ability of assembled system for measuring of autofluorescence lifetimes in-vivo.

Results achieved	• During the visit have been studied the basics of fluorescence time resolved spectroscopy and its application in bio-photonics. • Fiber optic system is suitable for in-vivo FLT measurements. • The fiber optic probe does not introduce the serious impact on the measured FLT. • Experimentally demonstrated the FLT changes after the photobleaching.
Reporting date	June 2013
Longterm feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 4 - 12 month)	1. Lihachev et al. "Fluorescence spectroscopy for estimation of anticancer drus sonodestruction in cell culture; Biophotonics-Riga 201,3, conf. thesis, August 26-31, Riga, Latvia. 2. Lihachev et al. "Fluorescence lifetime spectroscopy: potential for in-vivo estimation of skin fluorophores changes after low power laser treatment." Biophotonics- Riga 2013, conf. thesis, August 26-31,, Riga, Latvia. 3. f.Spigulis, A.Lihachev, f.Lesinsh, I.Ferulova, D.Jakovels "Laser-excited skin photo-bleaching effects." ICONO/LAT 20L3, conf. thesis,
Upgrade date	August 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	Dr. Kerstin Cuhls, researcher, born: Email: *Kerstin.Cuhls@isi.fraunhofer.de*
Total expenses during trip	Travel:287.28 Eur Secondment fee -450 EUR
Receiving organization. Hosting researchers: Dr.Arnolds Ūbelis Arnolds@latnet.lv	Riga Photonics Center Association FOTONIKA-LV, University of Latvia
Home institution	CC Innovations- und Technologie Management und Vorausschau, Fraunhofer Institut für System- und Innovationsforschung (ISI)
Date of participation	02.05.-04.05.2013
Aim of the visit	To elaborate partnership agenda and knowledge transfer for Technology Foresight in Photonics domain.
Description of visit (in details)	During the visit: ➢ Dr.Kerstin Cuhls worked together with team of researchers from FOTONIKA_LV to design roadmap and agendas for Technology Foresight workshops in photonics domain ➢ Has a meeting with the President of Latvian Academy of Sciences, prof. Ojars Sparitis and Vice President Prof. Andrejs Silins ➢ Contributed with discussion and provided lecture in the XXXII Coloqium of the project: *FP7-285912, under call FP7-REGPOT 2011-1 FOTONIKA-LV: Friday* ***03.05.2013*** *- 10.00-11.30* ○ **Dr. Kerstin Cuhls. How *Foresight is performed and can be used.***
Results achieved	*Roadmap towards next 6 month on foresight training issues of FOTONIKA-LV staff and other stakeholders in the Photonics domain*
Date of the first reporting	May 2013
Longterm feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 6-12 month)	The agenda and preparation stage is designed for: Photonics technologies in Baltic countries *The 1st regional workshop* on strategy planning and technology foresight *Time: October 9 – 11, 2013., Wednesday-Friday, Riga*
Upgrade date	August 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	*Kaspars Miculis, researcher, e-mail: michulis@latnet.lv*
Total expenses during trip	1581 LVL 2250 EUR
Receiving organization. Hosting researchers, e-mails	Institute of Electronics, Bulgarian Academy of Sciences Hosting researcher: Dr. Christina Andreeva, e-mail: christin@lu.lv
Home institution	University of Latvia, Faculty of Physics and Mathematics, Laser Centre
Date of participation	From 16.05.2013 to 30.05.2012
Aim of the visit	Development of scientific collaboration with scientists at the Institute of Electronics, BAS, on quantum manipulation of light and matter. Talk in a seminar.
Description of visit (in details)	During the visit, the researcher met with scientists at the Laser Systems group to exchange with latest scientific results and to identify possible joint interests for future collaboration. The researcher visited also of the laboratories of the hosting institute. He gave a seminar on transit time broadening, during which spectroscopic implication of this phenomenon in two-photon excitation schemes were discussed. Agreement between theoretical and experimental aspects for a planned forthcoming manuscript was examined jointly with the hosting scientist Dr. Andreeva.
Results achieved	1) Completed calculations of outer electron trajectories for Rydberg atom (hydrogen) in external microwave field; 2) compared the theoretical implication of the formation of Autler-Townes effect with the experimental observations of electromagnetically induced transparency at the hosting institute. Ramsey interference of laser-dressed states was also discussed; 3) gave a seminar on the topic: "Transit time broadening for two-photon excitation by Gaussian laser beam in a three-level ladder".
Reporting Date	June 2013
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 4 month)	The visit was undertaken following the invitation of Dr. Andreeva from the Institute of Electronics, BAS, who was recruited by the FOTONIKA-LV project. The visit of K. Miculis can thus be viewed as a return visit aimed at establishment of a new collaboration. A new manuscript is expected to result in near future. As a follow-up

	measure, the hosting scientist Dr. Andreeva will return again to Riga as a recruit of FOTONIKA-LV project in September 2013. From the longer-term perspective, possibilities of a joint IRSES-type proposal in the forthcoming Horizon 2020 Programme were discussed. Development of a joint proposal depends on publication of the call.
Upgrade date	Updated – August 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	Janis Zvirgzds, leader researcher, born 17.03.72 , janis.zvirgzds@lgia.gov.lv
Total expenses during trip	Transport – 132.31LVL and 43.11 EUR 5100.00 EUR
Receiving organization. Hosting researchers, e-mails	Aalborg University The Faculty of Engineering and Science Department of Development and Planning, Danish GPS Center, Prof. **Lars Bodum** Website: http://www.plan.aau.dk/, Phone: (+45) 99 40 99 40
Home institution	Institute of Geodesy and Geoinformatics, Association FOTONIKA-LV, University of Latvia
Date of participation	From 13.05.2013. to 15.06.2013.
Aim of the visit	Carry out scientific research project on software GNSS receiver development of GALILEO signals and precise timing within the photonic EN.
Description of visit (in details)	Participation in PhD Seminar on Issues of Modern GNSS, Positioning and Timing: - Global Navigation Satellite System Fundamentals - System and receivers. Theme of the paper include a review of available GNSS systems, their design and application possibilities. Was widely interpreted all applications of GNSS receivers in different spheres - geodesy, transport, aviation and agriculture. - Easy Suite I - GPS data processing software.; Easy Suite is developed in MATLAB GNSS data processing software. Software provides Read-RINEX data and processing. C / A code pre-processing, clock uncertainty of the large error in the exclusion from the calculations. - Multipath Reflected signal. Change in the structure. The reflected signal mitigation. Technical solutions: components and software. Signal filtering. Achieving high-precision built-up area using software filter. - GNSS signals GNSS signal structures and modulation. Signal tasks. Mathematical models of signal modulation and dispersion. Galileo signal

	modulation AltBOC law. Student exchange program: -Digital Signal Processing MATLAB software environment. Built-in functions and their application. MATLAB software environment. Software Development and operation. Made software modules. Function of creating and basic software. Graphics display. Reading data from files and saving files. Calculations with matrices. Software-receiver basics. GPS C / A code signal structure and the reception. Satellite signal processing for positioning and timing. The signal receiving part (Front end). Analog signal digitization. Data file content. Read-File software. Pre-treatment, testing. GPS C / A code structure. Code Generation with MATLAB software. Software-receiver GPS and Galileo signals. GNSS antennas and their structure. L1 frequency antenna receiving components and analog signal digitization. Receiver channels. Signal detection and fixing. Navigation data decoding and calculation. Carrier Demodulation and code. The reflected signal detection and exclusion of data. Data processing to compute a position. Satellite calculating your location. Error quantification. Receiver to compute a position. -Galileo satellite system structure and architecture design. Galileo system differs from existing systems, improvements and problems. New modulation speed performance, the primary use of the civil services, build continuity testing, compatible with other systems. Galileo's services. Satellite geometry, orbit types. Space part of the satellite, its structure, the lifetime of the installed equipment. Atomic clocks. Ground segment. System management and control. -Galileo satellite signal definition and specification. Frequency band allocation. Signal carrier. Signal modulation. BOC (Binary Offset Carrier). Data channels. Pilot-channels, data channels. Longer codes with fast demodulation of the possibility of a small memory need for a short period of repeatability for better fixation. -Galileo receiver architecture and performance. Receiver test conditions. Receiver, the consistency and support. Antenna requirements and design. Receiving components. Signal digitization. A digital signal processing. Signal correlation and lock. BOC signal modulation and lock. Tracking signal. Error Calculation of the signal. The reflected signal filtering. Position, velocity and time calculation algorithm. Navigational warnings. Receiver performance analysis software. Controllable Variables and values. User interface. GIOVE-A satellite signal and research.
Results achieved	Learned topics:

	Digital signal processing using MATLAB. Fundamentals of Global Positioning System software receivers. GPS C/A Code Signal Structure and acquisition. Data processing for positioning and timing. A Software-defined GPS and GALILEO Receiver. GALILEO overall Architecture GALILEO Signal-in-space definition GALILEO Receiver Design and performance Software program created for GPS signal acquisition and tracking
Reporting date	June 2013
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 4 month)	
Upgrade date	January 2014

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail,phone.	Prof. Harold Joseph Metcalf, senior researcher, e-mail: harold.metcalf@stonybrook.edu
Total expenses during trip	Travel 1593.69 USD Secondment fee -1050 EUR
Receiving organization. Hosting researchers:	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy, Association FOTONIKA-LV, University of Latvia; Dr.Aigars Ekers, Aigars.Ekers@lu.lv
Home institution	Stony Brook University, Dept. of Physics
Date of participation	From 16.06.2013. – 22.06.2013
Aim of the visit	The aims of the visit included: 1) engaging in joint research with the hosting team and further develop scientific collaboration between the University of Latvia and Stony Brook University; 2) giving a lecture for host's faculty students and a talk at the FOTONIKA-LV seminar; 3) Meeting with the leadership of the Latvian student chapter of the Optical Society of America.
Description of visit (in details)	During the visit, the recent experimental results to the researcher's group on Stimulated Raman Adiabatic Passage (STIRAP) in a beam of metastable He atoms were discussed, in particular with two recruits of the FOTONIKA-LV project Prof. Bezuglov and Dr. Ekers. The discussions focused on clarifying the possible explanations for the experimentally achieved population transfer efficiencies. The recent results of the hosting team on the formation of dark states upon laser-coupling of hyperfine level systems and their expression in the Autler-Townes spectra were discussed. The visiting researcher gave a lecture to students of the hosting university and a talk at the FOTINIKA-LV colloquium. He also met with the leadership of the Latvian chapter of the Optical Society of America.
Results achieved	1) a number of possible explanations for insufficient STRIAP population transfer efficiency in the Stony Brook experiment were identified; 2) plans for future collaboration and a visit of a researcher from Riga to Stony Brook have been drafted, subject to sufficient available funding for such visits;

	3) a FOTINIKA-LV colloquium talk "Efficient Excitation of Rydberg States Using STIRAP" and student lecture "Entropy Exchange in Laser Cooling" were given; 4) recent and future activities of OSA Latvian student chapter, as well as future support from OSA to the Latvian chapter were discussed and agreed upon.
Date of the first reporting	July 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, phone.	Dr. Malgorzata Anna GLODZ, senior researcher, e-mail: glodz@ifpan.edu.pl
Total expenses during trip	Travel 153,37 EUR Secondment fee -1200 EUR
Receiving organization. Hosting researchers:	Molecular Beam Laboratory of the Laser Centre Institute of Atomic Physics and Spectroscopy Association FOTONIKA-LV, University of Latvia Dr.Aigars Ekers, Aigars.Ekers@lu.lv
Home institution	Institute of Physics of the Polish Academy of Sciences
Date of participation	From 18.06.2013. – 25.06.2013.
Aim of the visit	To carry out scientific collaboration and prepare a joint publication on energy transfer in excited alkali-metal atom collisions.
Description of visit (in details)	During the visit, the researcher discussed the agreement of her experimental results with the theoretical calculations performed by Riga group. Jointly with the hosting scientists from the hosting group, she worked on the preparation of a joint manuscript. She also discussed the recent results of her group on electromagnetically induced transparency in an ultracold gas of rubidium Rydberg atoms and gave a talk at the colloquium of FOTONIKA-LV. An advanced version of a joint manuscript was performed, which will be finished and prepared after the visit.
Results achieved	1) An advanced version of a joint manuscript on collisional excitation energy transfer between rubidium Rydberg states has been prepared; 2) a talk on EIT in ultracold gas of Rb atoms entitled "Probing a state which is not probed" was given at the FOTONIKA-LV colloquium.
Date of the first reporting	July 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA-LV
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	*Dr.Janis Alnis, Lead researcher, born:* 16.05.74 *alnis@latnet.lv* *00371 27463408*
Total expenses during trip	Travel costs 39.50 EUR 2850 EUR
Receiving organization. Hosting researchers, e-mails	Swiss Federal Institute of Technology Zurich (ETH Zurich) ETH Institute for Particle Physics (IPP) Laboratory of Positron and Positronium Physics, http://www.ppp.phys.ethz.ch/research/index Dr. Paolo Crivelli paolo.crivelli@cern.ch
Home institution	Association FOTONIKA-LV *Institute of Atomic Physics and Spectroscopy,* *University of Latvia*
Date of participation	From 24.06.2013. - 12.07.2013
Aim of the visit	Preparation of the laser system for precision spectroscopy of positronium atoms.
Description of visit (in details)	Janis Alnis is collaborating with the ETH group lead by Dr. Paolo Crivelli aiming to measure the 1S-2S transition frequency of positronium. Positronium is an exotic atom consisting partially from antimatter and from normal matter and it is very suited to measure if optical transitions in antimatter can be calculated using the same QED theory. Janis Alnis with his exceptional expertise already made a major contribution developing the laser system during the two visits at ETH Zurich in 2012. The aim of the present visit was to integrate the laser to the positron beam line.
Results achieved	Laser system was integrated on the positron beam line. 500 W of circulating blue laser light were achieved inside an enhancement resonator in direct vicinity of the porous target producing positronium. The experiment is almost ready for data taking.
Reporting Date	July 2013
Longterm feedback: Conf. thesis, publications, project	Precision Laser Spectroscopy of the 1S-2S Transition in Positronium P. Crivelli, D.Cooke, A. Antognini, K. Kirch, J. Alnis, T.W.Hänsch DPG-Frühjahrstagung 2013, Hannover, 18.-22.03.2013 Poster presented by J.Alnis

initiatives etc. Upgrade (after each 4 - 12 month)	Precision laser spectroscopy of the 1S-2S transition in positronium Talk by Paolo Crivelli at Ringberg meeting, 2– 6.09.2013
Upgrade date	January 2014

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	*Dr Ilgmars Eglitis, leading researcher, born.: 04.04.1951, Ilgmars@latnet.lv , +371 28763738*
Total expenses during trip	_____3600_____ EUR
Receiving organization. Hosting researchers, e-mails	*Moletai Observatory Institute of Theoretical Physics and Astronomy Vilnius University,* Dr. Grazina Tautvaisiene, www: http://mao.tfai.vu.lt e-mail: Grazina.Tautvaisiene@tfai.vu.lt, Tel: +370 383 45 444
Home institution	*Astronomy observatory, Institute of Astronomy* *Association FOTONIKA-LV* *University of Latvia*
Date of participation	From___14.06.2013.__ to __07.07.2013.____
Aim of the visit	Acquire and develop weak image processing methods
Description of visit (in details)	14.06.2013 arrival to Moletai Observatory, Lithuania. 15.06.2013.-20.07.2013. The studies of interstellar absorption were held in cooperation with Professor Vytautas Straižys of Institute of Theoretical physics and Astronomy of Vilnius university (ITPA) – an outstanding specialist in this field of research. The discussion of joint research opportunities, to including spectral observation with Schmidt telescope in interstellar absorption studies. 22.06.2013-26.06.2013. Work on the improvement of observation methodology of faint asteroids in cooperation with Dr Kazimieras Černis (ITPA). 27.06.2013.-06.07.2013. Along with the V. Straižys work on scientific paper "New carbon stars in the Polar region". Return to Riga 07.07.2013.
Results achieved	The cooperation between ITPA and Institute of Astronomy of University of Latvia in research of small objects of solar system was expanded. Together with Dr Kazimieras Černis (ITPA) were developed the methodology of observations of weak object with a Schmidt telescope. Agreement was reached Prof. V. Straižys (ITPA) on cooperation in the studies of interstellar absorption in selected areas of the sky with a help of Baldone spectral observations.

	The paper "New carbon stars in the Polar region" was prepared. The results are: for 16 discovered carbon stars interstellar extinction, distances, effective temperatures and absolute magnitudes of C stars were obtained.
Reporting date	July 2013
Long-term feedback: Conf. thesis, publications, project initiatives etc. Upgrade (after each 4-12month)	
Upgrade date	January 2014

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA-LV
LU budget registration number	A6-2773-ZF-N-015
Participant, e-mail, m.phone.	Electronic Engineer Mr. Aleksandrs Švarcs, e-mail: shvarcs@lu.lv m.phone: +371 29763325
Total expenses during trip	150 EUR x 14 day = 2100 EUR
Receiving organization. Hosting researchers, e-mails	St.Petersburge State University, Physical faculty, Department of Optics and Spectroscopy http://optics.phys.spbu.ru/ Prof. Andrey N. Klyucharev, e-mail: anklyuch@gmail.com
Home institution	Association FOTONIKA-LV
Date of participation	From 11.06.2013. – 25.06.2013
Aim of the visit	Continuation of building up the professional expertise in operating and building supersonic molecular beams with electron and laser beams. and laser radiation at Physics Department of the St. Petersburg University.
Description of visit (in details)	During the visit, the researcher acquired new skills and expertise on various aspects of developing pulsed supersonic molecular beams crossed with electron beam and tunable femtosecond laser beams. Specifically, the focus was on designing automated crossed-beam experiments with simultaneous computer control of multiple experimental parameters, such as laser frequency control, control and monitoring of temperature and pressure of the atomic beam source, laser power monitoring, measurement of intensity distribution in the laser beam, etc.
Results achieved	The obtained new expertise in experiment control is being immediately applied in setting up the new experiments on observation of dressed state formation upon strong laser coupling of Na 3p and 3d states with the new laser system acquired via the FOTONIKA-LV project.
Date of the reporting	July 2013

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	Ojārs Balcers
Participants e-mail, m.ph.	Ojars.Balcers@lu.lv
Total expenses during trip	1445 EUR
Receiving organization, hosting researcher, e-mail	Gdansk University of Technology
Home institution	University of Latvia
Date of participation	3 – 11 August 2013
Aim of the visit	European Conference on Crystal Growth, Gdansk, Poland ISSCG-15
Description of visit (in details)	The event had two parts – summer school and presentations. I have attended both. This central to the sector conference was very close to us, the next is to be held in Japan.
Results achieved	It was very useful to learn the latest experimental developments of crystal growth and calculation methods, as well as to establish new contacts.
Reporting date	28 January 2015
Longterm feedback: conference thesis, publications, project initiatives etc.	Presentation: Balcers, O. "Crystal Growth Conference in Gdansk", 72nd Annual Scientific Conference of the University of Latvia, Natural Sciences, Photonics Section, Riga, Latvia, 7 February 2014.
Upgrade date	28 January 2015

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	Sandra Smalina
Participants e-mail, m.ph.	sandra.smalina@gmail.com
Total expenses during trip	1534 EUR
Receiving organization, hosting researcher, e-mail	Austrian Institute of Technology
Home institution	University of Latvia, Institute of Athomphysics and spectroscopy.
Date of participation	8 – 14 September 2013
Aim of the visit	Training School on Foresight, Austria, Participation in International Foresight Academia organized summer school: Futures Studies and Foresight as an Instrument for Public Engagement in Policy-making for a Complex and Uncertain Future.
Description of visit (in details)	The event was organized like a weeklong international seminar with case studies on different topics of foresight.
Results achieved	It was very useful to learn the latest approach and calculation methods, as well as to establish new contacts. Experience gained will be used to develop foresight exercise in FOTONIKA LV
Reporting date	September 2013
Longterm feedback: conference thesis, publications, project initiatives etc.	Publication: S.Smalina "Foresight studies for photonic industry in Latvia - project FOTONIKA-LV foresight workshops" 72nd annual scientific conference of University of Latvia NATURAL SCIENCES PHOTONICS
Upgrade date	28 January 2015

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	Ojārs Balcers
Participants e-mail, m.ph.	Ojars.Balcers@lu.lv
Total expenses during trip	1578 EUR
Receiving organization, hosting researcher, e-mail	Austrian Institute of Technology
Home institution	University of Latvia
Date of participation	8 – 14 September 2013
Aim of the visit	Training School on Foresight, Austria
Description of visit (in details)	The event was organized like a weeklong international seminar with case studies on different topics of foresight.
Results achieved	It was very useful to learn the latest approach and calculation methods, as well as to establish new contacts.
Reporting date	28 January 2015
Longterm feedback: conference thesis, publications, project initiatives etc.	Lesina, N. and Balcers, O. "Riga Photonics Centre – Key to awareness about Photonics", 72nd Annual Scientific Conference of the University of Latvia, Natural Sciences, Photonics Section, Riga, Latvia, 7 February 2014
Upgrade date	28 January 2015

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	Fescenko Ilja, Université de Fribourg
Participants e-mail, m.ph.	Ilja.fescenko@unifr.ch
Total expenses during trip	Only stipend, according agreement number 6013A78/67
Receiving organization, hosting researcher, e-mail	Univerity of Latvia, FOTONIKA-LV
Home institution	Université de Fribourg, Département de physique
Date of participation	From 31.01.2014 till 09.02.2014
Aim of the visit	Participate in common experiments according to FOTONIKA-LV working package (Task 3.9. Upgrade of low pressure plasma research facilities). To learn on rubidium and cesium vapor atomic magnetometers and 2D visualization of magnetic fields. To give a help with using "LabVIEW Imaging toolkit".Make a presentation at FOTONIKA-LV colloquium.
Description of visit (in details)	During this short visit, automation of low pressure plasma research facilities was under develloping using LabVIEW automatization system and LabVIEW Imaging toolkit. Researchers from the Institute of Atomic Physics and Spectroscopy were introduced to use the LabVIEW application for control of experimental facilities, data acquisition and processing. Besides, atomic magnetometry and measurement of magnetic fields using photon-atom interaction were discussed in framework of FOTONIKA-LV researches. These discussions were helpful for preparation of my paper about 2D visualization.
Results achieved	1. LabVIEW virtual tools were developped allowing remote reading of digital and analog sensors. 2. A presentation “Vizualization of magnetic fields by laser induced fluorescence from dark and bright atoms” was made at at FOTONIKA-LV colloquium. 3. Possibilities of futher cooperation were discussed and identified.
Reporting date	10.01.2014
Longterm feedback: conference thesis, publications, project initiatives etc.	The following paper was published in 2014 with acknowledgements to FOTONIKA-LV project: I. Fescenko and A. Weis, “Imaging magnetic scalar potentials by laser-induced fluorescence from bright and dark atoms,” Journal of Physics D, **47**, 235001, (2014).
Upgrade date	19.01.2015

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	
Participants e-mail, m.ph.	Prof. Nikolai Bezuglov, senior researcher, e-mail: bezuglov@nb16672.spb.edu
Total expenses during trip	1500 Eur
Receiving organization, hosting researcher, e-mail	Dipartimento di Fisica Enrico Fermi, INO-CNR, and CNISM, Universit`a di Pisa, Italy Prof. F. Fuso, fuso@df.unipi.it
Home institution	Association FOTONIKA-LV
Date of participation	From 31.01.2014 till 09.02.2014
Aim of the visit	Scientific collaboration on laser manipulation of a neutral cold Cesium beam, atomic nanofabrication and preparing common publications
Description of visit (in details)	This visit was planned during the first visit to Pisa University in 2013, February. It prolonged the previous collaboration with Prof. M. Allegrini group from Pisa University resulted in a number of common works on nonlinear laser spectroscopy of atomic states. The main efforts were directed on exploring accurate numerical algorithm based on Split Propagation Technique for explanation of the experimental results obtained by Prof. F. Fuso group.
Results achieved	The dependence of hyperfine (HF) levels population involved into D_2 line on the laser power which excites a cooled Cs atomic beam was found. It was demonstrated specific nontrivial features of the spontaneous cascades dynamics in the presence of 'dark' and 'bright' HF Zeeman sub levels combined with a dynamic laser mixing of HF sublevels. The common manuscript entitled "Optical pumping nonlinear dynamic effects in a slow beam of cold Cs atoms probed via photoionization" was prepared for submission to Phys.Rev.A
Reporting date	11.02.2014

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	*Kaspars Miculis, researcher, Physics*
Participants e-mail, m.ph.	***michulis@latnet.lv, +371-63724649***
Total expenses during trip	4850 EUR
Receiving organization, hosting researcher, e-mail	St. Petersburg State University, Physics Faculty, Andrey N. Klyucharev, **anklyuch@gmail.com**
Home institution	University of Latvia, Faculty of Physics and Mathematics
Date of participation	From 21.04.2014. to 20.05.2014
Aim of the visit	Collaboration with physicists, research work, transfer of knowledge.
Description of visit (in details)	The visit was dedicated to research and transfer of knowledge activities related to theoretical analysis. 1) One of the topics was calculations of outer electron trajectories for Rydberg atom (hydrogen) in external microwave field. Three-dimensional hydrogen atom under the action of an external electric field is studied by using an analytic model and a numerical simulation. 2) Second topic was related to penning ionization in collisions of two cold Rydberg atoms. 3) Report in the Petergof Workshop on Laser Physics-2014. 21-25 april (in poster presentations)
Results achieved	Results were reported in publications: 1) Efimov, D. K.; Bezuglov, N. N.; Klyucharev, A. ; Miculis, K.; Ekers, A. Analysis of light-induced diffusion ionization of a three-dimensional hydrogen atom based on the Floquet technique and split-operator method, Optics and Spectroscopy, Volume 117, Issue 1, pp.8-17, 07/2014 2) Efimov, D. K.; Bezuglov, N. N.; Klyucharev, A. N.; Gnedin, Yu. N.; Miculis, K.; Ekers, A. On the applicability of the one-dimensional model of diffusion ionization to the three-dimensional Rydberg hydrogen atom in a microwave field - Optics and Spectroscopy, Volume 117, Issue 6, pp.861-868 (12/2014) 3) Modeling of chemi-ionization with an atom or molecule in an excited state: $G^* + M \rightarrow M^{+\bullet} + e^- + G$. Results will be published in the paper "Penning ionization of a non-symmetrical atomic pair" (will be published in 2015)
Reporting date	May 2014

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Project Number	REGPOT-CT-2011-285912-FOTONIKA
Participant, e-mail, m.phone.	Researcher Meng-Jung Lee, born: 13.08.1987, e-mail: illuminating184@gmail.com
Total expenses during trip	Secondment fee 3150.00 EUR
Receiving organization. Hosting researchers:	University of Latvia, The institute of Atomic Physics and spectroskopy
Home institution	Ultracold Atom Laboratory, National Tsing Hua University, Department of Physics, Hsinchu, Taiwan, R.O.C. 30043 http://atomcool.phys.nthu.edu.tw/
Date of participation	From 01.05.2014 - 21.05.2014
Aim of the visit	The purpose of the secondment is to carry out transfer of knowledge activities in the area of laser cooling of Rb atoms. More specifically, the researcher shall assist and instruct the staff of Dr. Ekers' group in building a magneto-optical trap enabling cooling a cloud of Rb atoms from the room temperature to about 300 microkelvin. The long-term purpose beyond the duration of this visit is to achieve a substantial improvement of spectral resolution of interference structures in the Autler Townes spectra of hyperfine level systems.
Description of visit (in details)	During the visit researcher provided information and instructions about various Rb magneto-optical laser cooling system aspects and parameters, including how to determine or what parameters have been optimal in researchers previous studies. Researcher provided detailed information on such (1) methods on how to improve various MOT parameters, such as, using an additional 2D MOT to lower background atom temperature and increase the number of trapped atoms, (2) use of a dark and compressed MOT for achieving higher density of atomic cloud (3) the design of laser beams' alignment as the best matching of counterpropogation for each pair of beams, the guaranty of passing through the single point in the center of chamber, the beam splitting system with the adjustable and highly stable intensity, (4) vacuum system parameters as vacuum system design, vacuum detection from an ion gauge, and heating of Rb source.
Results achieved	Improved the design of vacuum system for the usage of Rb source, exchanged technical knowledge and ideas. Improved and tested connection between ion vacuum pump and experimental vacuum chamber. Improved various Rb-MOT design features to increase the flexibility of application during running experiments, and by reducing the operation time.
Date of the first reporting	

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	*Jegors Korovins*
Participants e-mail, m.ph.	*Yegor.korovin@gmail.com*
Total expenses during trip	1650 EUR
Receiving organization, hosting researcher, e-mail	University of Latvia, The institute of Atomic Physics and spectroskopy, Imants Bersons
Home institution	University of Amsterdam/ AEI Potsdam
Date of participation	27.05.2014.- 06.06.2014.
Aim of the visit	Deepening of scientific contacts; giving a seminar; developing ideas for further collaboration
Description of visit (in details)	Gave a seminar on the relation between high temperature superconductors and black holes; had regular discussions with Imants Bersons, Rita Veilande, Vyacheslavs Kashcheyevs, Andris Ambainis
Results achieved	The seminar delivered; new contacts established; Exchange of ideas and prospective topics for future collaboration took place
Reporting date	19.01.2015

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	*Dr ARVIND KUMAR SAXENA*
Participants e-mail, m.ph.	*arvindsaxenaa@gmail.com*
Total expenses during trip	Secondment fee of 2550 Euro+Flight ticket
Receiving organization, hosting researcher, e-mail	FOTONIKA CENTRE, Riga, Latvia, Prof Arnolds Ubelis
Home institution	Physical Research Laboratory, Ahmedabad, India
Date of participation	From 04.08.2014—20.08.2014
Aim of the visit	Scientific collaborations, Working on the Ion beam facility, writing a Marie-Curie Proposal.
Description of visit (in details)	I have visited FOTONIKA centre, Riga, Latvia for the purpose of seeking postdoctoral opportunity, collaborations, working on the Ion beam facility and writing Marie Curie proposal.
Results achieved	Discussions on the Ion beam facility, scientific discussions, and Marie-Curie project writing.
Reporting date	04/08/14
Longterm feedback: conference thesis, publications, project initiatives etc.	
Upgrade date	

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	*Dr ARVIND KUMAR SAXENA*
Participants e-mail, m.ph.	*arvindsaxenaa@gmail.com*
Total expenses during trip	Secondment fee of 2550 Euro+Flight ticket
Receiving organization, hosting researcher, e-mail	Oulu university, Physics department, Prof Marko Huttula
Home institution	FOTONIKA CENTRE, Riga, Latvia, Prof Arnolds Ubelis
Date of participation	From 04.09.2014—12.09.2014
Aim of the visit	-Scientific discussions for Marie-Curie Proposal and submission. -Seeking a good fruitful scientific collaboration between FOTONIKA CENTRE and the Electron Spectroscopy group of Oulu university, Finland
Description of visit (in details)	I visited ELSP group in Physics Department, Oulu university during 4-12 September 2014 with the aim of the submission of Marie-Curie-2014 application and seeking collaborations with Oulu university.
Results achieved	During my stay in Oulu, Marie-Curie proposal (2014) was drafted and submitted successfuly. I had several scientific discussions with ELSP team including Prof Huttula, his PhD students and postdoctoral fellows for the collaborative experimental work between Oulu university and FOTONIKA centre.
Reporting date	12/09/14

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	*Dr. Ilgmars Eglitis*
Participants e-mail, m.ph.	ilgmars@latnet.lv; *+37128763738*
Total expenses during trip	5550EUR
Receiving organization, hosting researcher, e-mail	Moletai observatory, Institute of Theoretical Physics and Astronomy; moletu.observatorija@gmail.com
Home institution	Institute of Astronomy, University of Latvia
Date of participation	From 03.10.2014 till 08.11.2014
Aim of the visit	Acquire and develop weak image processing and interstellar reddening methods. Preparation of paper.
Description of visit (in details)	03.10.2014. arrival to Moletai Observatory, LithuaniaTogether with Dr K.Černis mastering the SkySift processing sofware to detect and identify faint moving objects in Baldone observatory CCD images. Consultation with Professor V. Straižys by methodology of evaluation of the interstellar absorption which is very important to determine real distances of carbon stars, to evaluate temperature, absolute magnitude, distance, and bolometric values of newfound carbon stars in Baldone observatory. Consultation with Dr. R. Janulis was made about stepper motor installation on the Baldone Schmidt telescope 24-hour axis. Together with Dr J. Zdanavičius the processing method of Baldone Schmidt telescope astronomical plate digitized data reduction with the modified Linux/IRAF and Linux/Midas/RAMAFOT programs was carried out. The paper "Method for evaluating the astrometric and photometric characteristics of commercial scanners in their application for the scientific purpose" was sent to review.
Results achieved	Interstellar absorption evaluation methodology was developed. Stepper motor was installed on Baldone Schmidt telescope. Time impulses for controllers of stepper motor was taken using DOS software. Paper "Method for evaluating the astrometrisk and photometric characteristics of commercial scanners in their application for the scientific purpose" by Yu. I. Protsyuk, V.N. Andruk , M.M. Muminov, Q.X. Yuldoshev, Sh.A. Ehgamberdiev, I. Eglitis, M. Eglite, O.E. Kovylianska, V.V. Golovnya, L.V. Kazantseva, S. Kashuba, for issue Odessa Astronomical Publications, vol 27/2, 59-60, 2014 was prepared.
Reporting date	15.11.2014.
Longterm feedback: conference thesis, publications, project initiatives etc.	The article "Method for evaluating the astrometric and photometric characteristics of commercial scanners in their application for the scientific purpose" by Yu. I. Protsyuk, V.N. Andruk , M.M. Muminov, Q.X. Yuldoshev,

	Sh.A. Ehgamberdiev, I. Eglitis, M. Eglite, O.E. Kovylianska, V.V. Golovnya, L.V. Kazantseva, S. Kashuba, for issue Odessa Astronomical Publications, vol 27/2, 59-60, 2014 was published. Further cooperation plans with K.Černis, J.Zdanavičius and R. Janulis.
Upgrade date	15.01.2015.

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	Prof. Dr.-Ing. **Reiner Rudolf Jäger**
Participants e-mail, m.ph.	*Reiner Jäger (reiner.jaeger@web.de)*
Total expenses during trip	
Receiving organization, hosting researcher, e-mail	Institute of Geodesy and Geoinformatics, University of Latvia Janis.balodis@lu.lv
Home institution	Karlsruhe University of Applied Sciences (HSKA)
Date of participation	10.09.2014. – 15.09.2014.
Aim of the visit	Discussion on the eventual co-operation in National geoid improvement for Latvia
Description of visit (in details)	1.) "GNSS/MEMS Multisensor based Precise Out-and Indoor Navigation and Georeferencing" (3 lectures); 2.) "DFHBF 5.0 - A New Integrated Geodesy Approach for Regional Gravity Field Modelling and Height Reference Surface Computation" (2 lectures).
Results achieved	5 lectures on the research achievements of HSKA
Reporting date	
Longterm feedback: conference thesis, publications, project initiatives etc.	Common projects for PhD Latvian student studies
Upgrade date	15.09.2014.

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	Prof. Nikolai Bezuglov, senior researcher, e-mail: bezuglov@nb16672.spb.edu
Total expenses during trip	814 EUR
Receiving organization, hosting researcher, e-mail	University of Latvia, The Institute of Atomic Physics and Spectroscopy; Dr. Teodora Kirova, teo@lu.lv
Home institution	Saint Petersburg State University
Date of participation	From 27.10.2014. till 31.10.2014.
Aim of the visit	Scientific collaboration on laser-manipulation of the hyperfine structure sublevels in sodium atoms and preparation of a manuscript for publication in Phys. Rev. A .
Description of visit (in details)	This was the working visit to University of Latvia, continuing the earlier initiated works with Institute of Atomic Physics and Spectroscopy along with Laser Centre. The focus was on performing numerical simulations (Dr. Teodora Kirova) of Autler-Townes spectra which involved the entanglement of the hyperfine states. The visit was aimed as well an interpretation of the results obtained.
Results achieved	A treaty of nontrivial manifestations of adiabatic (dressed) states in a system of atomic states coupled by an external laser radiation and having nonzero hyperfine (HF) energy splitting was made. An analytical study of how multiple dark states are created from "grey" ones with the increase of the laser power is provided in the case of a generalized multilevel Λ-scheme. The performed numerical data for a typical optical Autler-Townes (AT) type of experiments in a three-level ladder scheme (a weak probe field in the first excitation step and a strong coupling field in the second step) have exhibited the dramatic role of the newly created dark states in essential diminishing of the AT spectra components. For a specific excitation ladder scheme 3s 1/2 ($F'' = 2, 1$) → 3p 3/2 → 4d 5/2 in sodium it was demonstrated as well the death of some bright AT components as a result of the HF splitting, upon increase of the coupling field. Our treaty has a principal importance for applied aspects of quantum optics where laser manipulation of quantum states via engineering of desired dressed states deals with the nondegenerate HF structure of real atoms.
Reporting date	13.11. 2014

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Secondementvisitreport

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	*Jumisree Sarmah Pathak*
Participants e-mail, m.ph.	*jumi.sarmah@gmail.com*
Total expenses during trip	
Receiving organization, hosting researcher, e-mail	Institute of Atomic Physics and Spectroscopy, Riga, Prof Arnolds Ubelis, arnolds@latnet.lv
Home institution	Indain Institute of Taecher Education, Gandhinagar, Gujarat, India
Date of participation	From 21.12.2014 till 03.01.2015
Aim of the visit	1. To seek scientific collaboration 2. To present my scientific research work 3. scientific discussions on future research project possibilities 4. lab visits and discussions in university
Description of visit (indetails)	With the aim of seeking scientific collaborations between IITE Gandhinagar (India) and ASI Riga (Latvia), I have visited Institute of Atomic Physics and Spectroscopy, Riga between 21 December 2014 to 03 January 2015. I delivered a colloquium on my scientific research work entitled "SPECTROSCOPIC STUDY OF NANOPARTICLES, SPICES AND CLUSTERS " on 30th December 2014. I had several discussions on future scientic project writing possibilities with Prof Arnolds Ubelis and other lab mates. I had fruitful scientific discussions on the existing ion beam facility GRIBAM in ASI, Riga.
Results achieved	1. Discussions on future scientific collaborations 2. Delivered a colloquium on my research work 3. Fruitful discussions on possibilities of writing scientific projects in collaborations 4. Exploration of the existing ion beam facility GRIBAM in ASI, Riga 5. Lab visits
Reporting date	21/12/14

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	Diana Haritonova
Participants e-mail, m.ph.	diana.haritonova@inbox.lv , +371 28321239
Total expenses during trip	3505 EUR (scholarship: 3150,00 + travel expenses: 355,00)
Receiving organization, hosting researcher, e-mail	Institute of Meteorology and Geophysics, University of Vienna, ao. Univ.-Prof. Dr. Bruno Meurers, bruno.meurers@univie.ac.at
Home institution	Institute of Geodesy and Geoinformatics, University of Latvia
Date of participation	From 11.01.2015 till 31.01.2015
Aim of the visit	– to present a report on activities and research areas of the Institute of Geodesy and Geoinformatics, University of Latvia; – to improve knowledge on Earth tides; – to evaluate obtained coordinate time series of Latvian GNSS stations, – to get information on the processing and implementation of the vertical deflection measurements in calculations of national geoid model.
Description of visit (in details)	– consultations from Prof. Bruno Meurers on Earth tide analysis; – consultations from Prof. Robert Weber on GNSS data processing; – presentation about activities of the Institute of Geodesy and Geoinformatics, University of Latvia, at the colloquium of the Institute of Meteorology and Geophysics, University of Vienna.
Results achieved	– program for power spectral density (PSD) useful for the analysis of the Earth tide effect; – coordinate time series evaluation for the Latvian GNSS stations; – Austrian experience in calculations of local astrogeodetic geoid; – new contacts with leading researchers in the field of geodynamics and GNSS data processing; – literature on the effect of the Baltic Sea level on gravity.
Reporting date	22.01.2015
Longterm feedback: conference thesis, publications, project initiatives etc.	in progress.

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Secondement visit report

Project Number	REGPOT-CT-2011-285912-FOTONIKA
LU budget registration number	A6-2773-ZF-N-015
Participants	Prof. Nikolai Bezuglov, senior researcher, e-mail: bezuglov@nb16672.spb.edu
Receiving organization, hosting researcher, e-mail	Italy, Dipartimento di Fisica Enrico Fermi, INO-CNR, and CNISM, Universit`a di Pisa, Prof. Francesco Fuso; fuso@df.unipi.it
Home institution	University of Latvia, The Institute of Atomic Physics and Spectroscopy;
Date of participation	From 20.01.2015 till 30.01.2015.
Aim of the visit	(I) Scientific collaboration on the photon-matter interaction involved a neutral cold Cesium beam and a pump laser; (ii) a finalisation of two collaborative works.
Description of visit (in details)	This visit was planned as a continuation of two previous visits of prof. N. Bezuglov to Pisa University, Italy. The visit was aimed to finalize the collaborative works and summarise the results obtained on nonlinear laser spectroscopy of atomic states. Experimental results along with their theoretical interpretation for excitation spectra of a slow and cold Cs beam, extracted from a pyramidal MOT, were presented in two manuscripts. The first one under the title "Nonlinear dynamic effects in optical pumping upon resonant excitation of ultra-slow beam of cold Cs atoms" was decided to submit to Phys. Rev. A journal in the beginning of February, 2015. The second manuscript should be submitted to Optics&Spectroscopy journal in February, 2015.
Results achieved	The dependence of 6^{2}P_{3/2} hyperfine (HF) levels population on the laser power which excites a cooled Cs atomic beam is probed by means of a photoionization ladder-like scheme. The relatively long time (about 180 μs) spent by slow atoms inside the resonant laser beam allows the exploration of an unique interaction regime heavily affected by time-dependent optical pumping. It was demonstrated specific nontrivial features of the spontaneous cascades dynamics in the presence of 'dark' and 'bright' HF Zeeman sublevels combined with a dynamic laser mixing of HF sublevels. The computed evolution of population redistribution within the HF structure, obtained in integrating the multilevela optical Bloch equations, permits to reproduce with excellent agreement the experimen-tal data. The provided analysis of the numerical results explains main trends in the experimental findings with pointing out the importance of the mutual details of the both pumping and ionizing lasers space profiles in which the atomic motion takes place.
Reporting date	20.01.2015

Annex 4: Abbreviations

Abbreviation	
Association FOTONIKA-LV	Association of three University of Latvia research institutes: Institute of Atomic Physics and Spectroscopy, Institute of Astronomy and Institute of Geodesy and Geoinformation
Baltic Sea Region	11 countries: Baltic countries (Estonia, Latvia and Lithuania), Nordic countries (Denmark, Finland, Iceland, Norway and Sweden), Germany (Northern), Poland (Northern), and Russia (North-western and Kaliningrad)
D	Deliverable
ERA	European Research Area
EU	European Union
EU Council	Council of the European Union - a part of the bicameral EU legislature, representing the executives of EU member states
EU Council in Gothenburg	86th European Council meeting in Gothenburg, 15–16 June 2001
FP7	Seventh Framework Programme of the European Community for research, technological development and demonstration activities
HORIZON 2020	EU Framework Programme for Research and Innovation (2014-2020)
ICT	Information and Communication Technologies
Lisbon Strategy	also known as the Lisbon Agenda or Lisbon Process - an action and development plan devised in 2000, for the economy of the European Union between 2000 and 2010
Photonics21	European Technology Platform for photonics
RTD	Research and technology development
SME	Small and medium enterprise
UN	United Nations
Vision of Innovation Union 2020	EU's growth strategy on employment, innovation, education, social inclusion and climate/energy to be reached by 2020
WP	Work package