

## RadioNet support for Short Term Missions (staff exchange) Application form

STM INFORMATION	
APPLICANT 'S NAME	Roman Khrabatyn
APPLICANT'S AFFILIATION	Ivano-Frankivsk National Technical University of Oil and Gas
HOST INSTITUTE	INAF-Osservatorio Astronomico di Cagliari Via della Scienza 5 - I-09047 Selargius (Cagliari)  Tel: +39 070 711801 - Fax +39 070 71180222  e-mail: <a href="mailto:possenti@oa-cagliari.inaf.it">possenti@oa-cagliari.inaf.it</a>  Alessandro Navarrini, Primo tecnologo, email : <a href="mailto:navarrin@oa-cagliari.inaf.it">navarrin@oa-cagliari.inaf.it</a> , Tel. : 07071180243 (The Invitation letter will be provided upon request )
DATE OF THE STM	September 2017-October 2017
TOTAL COST OF STM	1500 EURO (for 2 weeks)
OTHER SOURCES OF FUNDING	-
<b>Request</b> (max. 2,5 pages)	
<b>Topic</b>	<p><i>Development, improvement, and adjustment of tracking systems for monitoring the position of the sun and stars.</i></p> <p><i>IFNUNG is actively involved in the development and implementation of the latest environmental and renewable energy sources, in particular in the use of solar energy. University researchers are exploring and implementing new technologies to increase the efficiency of solar power plants.</i></p> <p><i>The efficiency productivity of solar panels depends directly on the amount of solar energy received. The maximum value of the generation of electricity reaches at the time when the working surface of the solar modules is located perpendicular to the flux of solar radiation.</i></p> <p><i>Taking into account the peculiarity of the trajectory of the daily movement of the sun, the optimal position of the fixed (stationary) solar battery in the azimuth is an angle of about 150 °. Practical experiments show that the solar module fixed in this position in the evening and in the morning loses about 75% of the generation from the maximum possible volume. In addition to daytime travel in the direction from west to east, the Sun additionally performs a seasonal movement between the north and south - for a year it is about 46 °. Therefore, to increase the productivity of solar power plants, it is necessary to use monitoring systems monitoring the position of the Sun.</i></p> <p><i>Dynamic panel fastening systems (moving trackers) automatically track the position of the sun throughout the daylight and orientate the solar mods attached to them, as well as provide a correction of the angle of the panel depending on the time of year. It was investigated that the introduction of tracking technologies in the position of the Sun increases the efficiency of such power plants by 30-40%, and in some cases by more than 50% compared to solar power plants using stationary solar cells.</i></p>
<b>Proposed work</b>	<p><i>During a visit to the SRT, I would like to see the material and technical base, take part in the management of the SRT, visit laboratories, discuss what happens and how emergency situations are solved, get acquainted with the computer software used for tracking systems.</i></p>

<p><b>Cross-disciplinary</b></p>	<p><i>IFNUNG is actively involved in the development and implementation of the latest environmental and renewable energy sources, in particular in the use of solar energy. University researchers are exploring and implementing new technologies to increase the efficiency of solar power plants, using tracking system that is similar to SRT.</i></p>
<p><b>Impact</b></p>	<p><i>It is interesting that such systems, tracking the position of the sun, have much in common with the monitoring systems used in telescopes, in particular the the Sardinia Radio Telescope (SRT). Since university researchers are constantly interested in new developments and ideas in tracking systems, learning the experience of managing this telescope would be extremely interesting, and the experience gained could be used and implemented in our developments. In its turn, IFNTUNG is pleased to invite scientists from the the Sardinia Radio Telescope for a laboratory visit and familiarization with our developments and technologies.</i></p>
<p><b>Curriculum Vitae</b></p>	<p><i>Elementary heterogeneously polarized field modeling Optics Letters, Vol. 36, Issue 11, 2011, pp. 2137-2139</i></p> <p><i>Singularities of the Poynting vector azimuth in heterogeneously polarized vector fields SPIE Proc. – 2009. – V. 7297. – 72970A</i></p> <p><i>Potentiality of experimental analysis to characterize the Poynting vector components Ukr. J. Phys. Opt. – 2008. – V. 9.</i></p> <p><i>Singularities of the Poynting vector azimuth in heterogeneously polarized vector fields The 4th International Conference "Advanced Topics in Optoelectronics, Microelectronics and Nanotechnologies" ATOM-N August 2008</i></p>



## CURRICULUM VITAE

### ROMAN I. KHRABATYN

#### CANDIDATE OF PHYSICAL AND MATHEMATICAL SCIENCES (Ph.D. in Physics)

**Address:** 24-Serpnya, 10, Ivano-Frankivsk, 76006, Ukraine  
**Telephone:** (380)-67-4205274  
**Date of birth:** 20.07.1974  
**Marital status:** married, son (2004), daughter (2007)

**Objective:**

*To find a challenging position which will meet my competencies, capabilities, skills, education and experience.*

**Education:**

12.06.2017-16.06.2017  
26.10.2012

Staff mobility in Poznan (Poland), Erasmus + awarded the academic title Docent of the Department of Software for the Automated Systems, Ivano-Frankivsk State Technical University of Oil and Gas (IFSTUOG).

09.09.2009

awarded scientific degree (Ph.D. in Physics)  
Diploma candidate of physics and mathematics sciences.

2001-2003

Student at the Ivano-Frankivsk National Technical University of Oil and Gas (IFNTUOG).  
Faculty of Automation and Electrification,  
Major: Programming-engineer (second higher education degree)  
Diploma of a Specialist,  
Ivano-Frankivsk, Ukraine.

10.12.1998- 31.12.2001

Post-graduate student at the Ivano-Frankivsk State Technical University of Oil and Gas (IFSTUOG)  
Faculty of Automation and Electrification,  
Department of Automation and Computer Sciences,  
Ivano-Frankivsk, Ukraine.

04.10.1999-10.10.1999

XVI International School-Seminar "Methods and Devices for Technical Diagnostics"  
IFSTUOG, Ivano-Frankivsk, Ukraine  
Course "English for Business Purposes",  
Achievement Certificate, Ivano-Frankivsk, Ukraine.

26.01.98-13.03.98

The Advanced Course in Optical Technologies,  
Attendance Certificate,

14.04.97-31.12.97

Association for the Institution of the Free University of Nuoro (AILUN), Nuoro, Italy.

27.11.97-02.12.97

Course on "Optical Sensors and Microsystems: New Concepts, Materials, Technologies",  
Eriche, Italy.

1991-1997

Chernivtsy State University,  
Engineering and Technical Department,  
Correlation Optics Department,  
Qualifications: engineer majoring in optics

1981-1991

Diploma of a Specialist (with Honors), Chernivtsy, Ukraine.  
Secondary School №16, Full Secondary Education Certificate,  
Ivano-Frankivsk, Ukraine.

***Experience and research work:***

12.03.2015 –present	Head of Sector of Academic Mobility, Ivano-Frankivsk National Technical University of Oil and Gas (IFNTUOG).
15.02.2015– present	Expert Committee Member of the Minor Academy of Sciences (Computer Sciences Subdivision)
15.05.2015-present	The Head of the State Examination Board (Ivano-Frankivsk Commercial Cooperative College named after S. Granat) Ivano-Frankivsk, Ukraine
21.11.2012 –present	Expert of the TEMPUS project: National Education Framework for Enhancing IT Students' Innovation and Entrepreneurship
2001- present	Associate Professor at the Department of Software for the Automated Systems, Ivano-Frankivsk State Technical University of Oil and Gas (IFSTUOG). Ivano-Frankivsk, Ukraine
2006-2009	Research work devoted to "Singularities of the Poyntig vector azimuth and structure of optical fields" Thesis for gaining of the academic degree on Physics and Mathematics according to the major Optics and Laser Physics Chernivtsi, Ukraine
10.12.98-2001	Research work devoted to "Method and means of ecology diagnostics - technical state of gas pumping unit", Ivano-Frankivsk, Ukraine.
15.10.98- - present	Lecturer of Physics IFSTUOG, Pre-University Training Department, Ivano-Frankivsk, Ukraine.
01.01.99- 2006	Member of the Entrance Application Commission, An examiner of Physics, IFSTUOG, Ivano-Frankivsk, Ukraine.
08.09.97-31.12.97	Research work on "Circular Fringe Pattern Used for the Spherical Surface Testing", AILUN, Italy.
01.07.96-10.02.97	Work on elaboration of the Primary Processing Block for the Information of the Holographic System of the Ultrasound Introscopy, IFSTUOG, Ivano-Frankivsk, Ukraine.

***Technical Skills:***

Knowledge of laser, spectrograph, interferometers and others optical and mechanical instruments.

***Computer Skills:***

Basic, Pascal, Matlab, MS Office, MS DOS, INTERNET, VB, MathCAD, C++, Java, Photoshop, WordPress, others.

***Languages:***

Native speaker of Ukrainian, fluent Russian,  
Good English (B2), elementary Italian, Polish.

***Personal qualities:***

Punctual, motivated, persistent, responsible, sociable, industrious, have analytical mind, have the ability to work in team and independently.

***Organization work***

Member of the Organizing Committee of the Ukrainian conference of young scientists and graduate students "Information Technology in Education, Technology and Industry"  
Ivano-Frankivsk, 08-11 October 2013

**References:****1 Prof Volodymyr Yurchyshyn**

Head at the Department of Software for the Automated Systems,  
Ivano-Frankivsk State Technical University of Oil and Gas, Ukraine  
[v.yurchyshyn@nung.edu.ua](mailto:v.yurchyshyn@nung.edu.ua)  
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**2 Prof Alessandro Navarrini**

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Via della Scienza 5 - I-09047 Selargius (Cagliari)  
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07071180243  
[alessandronavarrini@gmail.com](mailto:alessandronavarrini@gmail.com)

**3 Prof Oleg V. Angelsky.**

Director of the PTCS Institute of Yuriy Fedcovich Chernivtsi  
National University, Academician of University Association of  
Ukraine, President of Ukrainian Society of Pure and Applied Optics  
(National branch of EOS), ICO Galileo Galilei Award, FELLOW of  
SPIE, FELLOW of OSA, FELLOW of Institute of Physics UK  
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**Articles**

Elementary heterogeneously polarized field modeling	Optics Letters, Vol. 36, Issue 11, 2011, pp. 2137-2139
Singularities of the Poynting vector azimuth in heterogeneously polarized vector fields	SPIE Proc. – 2007. – V. 7008. – 700814G
Singularities of the Poynting vector azimuth in heterogeneously polarized vector fields	SPIE Proc. – 2009. – V. 7297. – 72970A
Potentiality of experimental analysis to characterize the Poynting vector components	Ukr. J. Phys. Opt. – 2008. – V. 9.
Singularities of the Poynting vector azimuth in heterogeneously polarized vector fields	The 4 <sup>th</sup> International Conference "Advanced Topics in Optoelectronics, Microelectronics and Nanotechnologies" ATOM-N August 2008
Shift of application point of angular momentum in the area of elementary polarization singularity	Journ. of Optics A: Pure and Appl. Opt. – 2008 – Vol. 10.
Singularities of the Poynting vector azimuth in heterogeneously polarized vector fields	The 4 <sup>th</sup> International Conference "Singular Optics" (SO'2008) Alushta
The behavior of the Poynting vector in the area of elementary polarization singularities	Opt. Appl. – 2007. – Vol. XXXVII. – N3
Shift of application point of angular momentum in the area of elementary polarization singularity	2 <sup>nd</sup> European Optical Society Topical Meeting: "OMS07", Italy, abstract booklet.
Others (more than 75)...	