

PRINCIPAL INVESTIGATOR CERCA UNA HOST INSTITUTION IN EUROPA

**EU FRAMEWORK PROGRAMME 7**  
**IDEAS SPECIFIC PROGRAMME**

Date:	June 22, 2009
Area:	<b>Possible use of x-ray spectroscopy and scattered radiation in new medical diagnostic techniques</b>
Call:	FP7 (Ideas – ERC Advanced Investigator grant for the domain Physical Sciences and Engineering (PE))
Deadline:	preferably within the next round of open calls (AdG3, in Autumn 2009)

INFORMATION OF ORGANIZATION	
Name of organization	University of Novi Sad Faculty of Sciences
Project Team	Dr Miodrag Krmar (Principal Investigator), Associate Professor, Physics Department
Organization type	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Research Education Industry Technology Transfer SME <input type="checkbox"/> Other (please provide details) Faculty of Sciences is a public, HE, governmental, legal, non-profit, organisation.
Organization Size (employees)	<input type="checkbox"/> < 10 <input type="checkbox"/> 10-49 <input type="checkbox"/> 50-99 <input type="checkbox"/> 100-199 <input type="checkbox"/> 200-249 <input checked="" type="checkbox"/> >250 Size : 496 staff of which 309 are academic
Short description of organization (main research activities)	University of Novi Sad Faculty of Sciences consists of five departments: Department of Biology and Ecology, Department of Physics, Department of Geography, Tourism and Hotel Management, Department of Chemistry, Department of Mathematics and Informatics. Besides promoting the Faculty's entrepreneurial spirit, wider objective is to foster the domestic economy and create strong relations between technology, research, practice and entrepreneurship. Primary goal of scientific and research work is to contribute to work in fundamental investigations by using our own results together with all other available in the country and abroad, with the overall benefit to the society and economy. The strategy of the Faculty is oriented towards gaining new knowledge through research and education in order to facilitate integration into the European Research Area. Besides this, our laboratories offer their services to domestic institutions. Some of those laboratories are: <i>Laboratory for radioactivity and dose measurement, Laboratory for gamma source activity and gamma spectrometer calibration, Laboratory for Biochemistry, CABBY – Centre for Preservation of Biodiversity of the Balkan Island, Laboratory for Palynology, Laboratory for the Ambrosia and other Allergic Plants</i> , etc. At the Department of Mathematics and Informatics the Centre of Excellence officially recognised by our Government was established under the name of <i>Centre for mathematic research of non-linear phenomena</i> . Besides this one, numerous other domestic and international projects helped establish several other laboratories and centres of excellence: <i>Centre for Excellence for Environmental Chemistry and Risk Assessment, LECOTOX-Laboratory for Ecotoxicology, ALARM - Assessing LARGE scale Risks for Biodiversity with tested Methods, ADAGIO - ADAPtation of Agriculture in European RegIOns at Environmental Risk under Climate Change, RRP-CMEP - Reinforcement of Research Potential in centre for Meteorology and Environmental Predictions</i> . <a href="http://www.pmf.ns.ac.yu/">http://www.pmf.ns.ac.yu/</a>
Project Proposal Scope and Objectives	I am interested in <b>new x-ray diagnostic techniques based on measurement (and spectroscopy) of scattered and transmitted radiation. Broad spectra of application including</b>

	<p><b>explosive detection.</b></p> <p>1. Spectroscopy of x-rays and measurement of scattering x-radiation are not frequently used in standard medical diagnostic procedures. Most of the diagnostic information usually are collected by measurement of integral intensity of transmitted radiation. Intensity of coherent scattered radiation is very dependent on mean atomic number of scattering material. Preliminary measurements carried out in first phase of US NIH (National Institute of Health) on bone mimic materials showed that simultaneous measurement of well-collimated transmitted and forward scattered radiation can be very sensitive index of bone mineral density. It can be used in developing of superior osteoporosis diagnostic technique.</p> <p>2. Transmitted and forward scattered radiation can provide information about small variations in soft tissue composition. It can be excellent base in new mammography imaging technique developing. Technical requirements for utilization of forward scattered – transmitted technique are just proper filtration of x-ray beam and simple detectors, (there is no need for energy-sensitive detectors).</p> <p>3. Simultaneous measurement of forward and backward radiation scattered from same volume element, selected by narrow collimators can be used for absolute determination of mean atomic number of scattering material. In this case measurement scattered x-ray spectra is required. New developed CdTe detectors can provide basic spectroscopy data.</p> <p>4. Another aspect of introducing x-ray spectroscopy in diagnostic is that standard Double Energy Absorptiometry techniques can be significantly improved by use of spectra of transmitted radiation. Spectroscopy can eliminate hardening effect.</p> <p>5. Measurement of forward scattered and transmitted radiation can be excellent platform for developing of new method for detection of explosive materials. New device based on this method can significantly improved security systems for language control at airports.</p>
Expertise offered	<p>More than 20 years of research experience in Nuclear Physics (gamma spectroscopy, nuclear structure, low-temperature orientation, rare nuclear events, etc) and Medical Physics (characterization of therapy and diagnostic beams, new x-ray diagnostic techniques etc.)</p> <p>Parallel with current research activities in Serbia, I am holding a couple of small US NIH (National Institute of Health) grants, in California, in capacity of the Principal Investigator. I finished the first phase of one of the projects, the second was approved and is still running.</p> <p>Now I am at my permanent job in Serbia and looking for a partner organization interested in possible application for FP7 or any other similar program.</p> <p>General motivation for my attempts to find partners for research is to try continuing my reserach activities in Europe, at home, or as close as possible to home.</p>
Target partners' organisation type	<p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p> <p>Research Education Industry Technology Transfer SME</p> <p><input type="checkbox"/> Other (please provide details)</p>
Target partners' expertise sought	<p>Target partner should be an institution or a group having experience in x-ray radiation detection and spectroscopy.</p> <p>Considering that new x-ray diagnostic technique should be developed, it <b>would be optimal that partner organization is involved in diagnostic Medical Physics, imaging etc.</b></p> <p>All institutions working in developing the diagnostic x-ray systems are welcome.</p>
Target countries	European Countries
Other partners in the consortium already identified (with their countries)	
International projects already	Principal Investigator in two US NIH projects:

undertaken	1 R43 AR053766-01 ; x-Ray Scattering Bone Densitometry 1 R43 AR055403-01A1 ; Spectroscopic x-Ray Bone Densitometry
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