

Sergiu Vacaru | senior researcher in mathematical physics, PhD

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Professional profile

Dr Sergiu Vacaru has 40 years of experience as a research/visiting/sabbatical professor and lecturer on mathematical particle physics, gravity and cosmology, and geometric methods in physics; such an activity includes 5 years of teaching/ tutoring experience of university, college and high school (selected) students; common publications with international scholars and young researchers; supervision of PhD, master and bachelor degrees on mathematical physics, beginning with office worker, warehouse and post walker.

Key Achievements/Publications/Projects

- 120 peer-reviewed and articles on physics and mathematics in high impact journals; more than 200 scientific works published by editors in North America, Western and Eastern Europe; 8 monographs and university textbooks and lecture notes; and more than 360 titles for papers, preprints, scientific talks etc.
- 20 long-/ short-term NATO and UNESCO fellowships; director of governmental grants in Romania and R. Moldova, visiting professor and senior research positions at CERN-Geneva: Fields and Perimeter Institutes in Canada; M. Planck – W. Heisenberg Institute in Munich and A. Einstein Institute, Potsdam-Germany; I. Newton Institute, Cambridge University, UK; California State University, Fresno, USA: CSIC Madrid and IST Lisbon etc.
- Titles: PhD and CS-I, senior researcher of grade 1 - the Romanian variant of “research professor”, doctor in physics and mathematics in former USSR
- publications can be found in Internet:
http://inspirehep.net/search?ln=en&ln=en&p=f+a+Vacaru&of=hb&action_search=Search&sf=earliestdate&so=d&rm=&rg=250&sc=0

Specializations: (i) main fields: mathematical physics; geometry and physics; gravity and strings; (ii) other fields: nuclear physics, condensed matter physics; (iii) university and research professor pedagogical activity (pluralistically): astrophysics and space sciences (1992-1993; Romanian and Russian); higher mathematics and mathematical modelling in economics, theory of probability and mathematical statistics, mathematical programming (English, 1996-1997); supervision graduate/post-graduate thesis (Romanian and Russian, 1992-2001); partial differential equations and discrete optimization (English, 2005)

Research activity and interests (with peer-reviewed publications and teaching):

General relativity and modified gravity; exact solutions in gravity: black holes, wormholes, solitons and pp-waves, cosmological solutions; (super) gravity and strings; gauge gravity; quantum gravity; mathematical cosmology and astrophysics; generalized Finsler-Lagrange-Hamilton (super) geometry and physics; stochastics and locally anisotropic thermodynamics and kinetics; quantum field & geometric methods in condensed matter physics; fractional calculus and geometry, with applications; geometry of (time) quasicrystals and quasi-periodic structures in physics and cosmology; deformation & geometric quantization; nonholonomic and almost Kaehler geometry; Clifford & Dirac structures; spinors and twistors; geometric methods in physics & mechanics; noncommutative geometry and gravity, algebroids and physics, nonholonomic Ricci flows and applications in physics; classical and quantum information geometry.

Career summary: employment and long-term fellowships

- 1/ Oct 2019 - Present **Yuriy Fedkovych Chernivtsi National University, Institute of Applied-Physics and Computer Sciences, Department of Theoretical Physics and Computer Modelling, 101 Storozhynetska street, 58029, Chernivtsi, Ukraine**
position: **visiting senior researcher**
- 2/ Aug 2016 - Present **California State University at Fresno, Department of Physics, Fresno, California, USA**
position: **adjunct assistant professor**
- 3/ Jun 2009 – May 2018 **University Alexandru Ioan Cuza, UAIC, Iasi, Romania**
position: **director of Project IDEI; researcher and CS-1 till Dec 2015**
- 4/ Jun 2016 – Jun 2017 **Quantum Gravity Research (non-profit org.), Topanga, CA, USA**
position: **research scientist following a consulting agreement**
- 5/ Sep 2006 – Sep 2008 **Fields Institute for Research in Math Sciences, Toronto, Canada**
position: **visiting researcher**
- 6/ Nov 2005 – Jul 2006 **Brock University, Dep. Mathematics, St Catharines, Ontario, Canada**
position: **visiting international professor (research and teaching)**
- 7/ Sep 2004 – Aug 2005 **Supreme Council for Scientific Research, CSIC, Institute of Mathematics and Fundamental Physics, IMAFF, Madrid, Spain**
position: **sabbatical professor**
- 8/ Dec 2001 – May 2005 **Technical University of Lisbon, Instituto Superior Tecnico, IST, Dep. Physics and Math., Lisbon, Portugal**
position: **NATO Portugal fellowships for young researchers**
- 9/ Oct 2001 – Nov 2001 **California State University at Fresno, Department of Physics, Fresno, California, USA**
position: **visiting researcher**
- 10/ Mar 2001 – Sep 2001 **Institute for Space Sciences, ISS, Bucharest-Magurele, Romania**
position: **principal senior researcher of grade 1, 2001**
- 11/ Jun 2001 - Jul 2001 **University of Athens, Department of Math., Athens, Greece**
position: **visiting professor**
- 12/ Sep 1997 – Jul 1998 **International Independent University, Chisinau, R. Moldova**
position: **associate professor (pluralistic, teaching in English)**
- 13/ Sep 1997 – Jul 1998 **Academy (University) of Economic Studies, Chisinau, R. Moldova**
position: **associate professor math (pluralistic, teaching in English)**
- 14/ Sep 1992 – Jul 1993 **Tiraspol State University relocated in Chisinau, R. Moldova**
position: **lecturer on astrophysics (pluralistic, Romanian & Russian)**
- 15/ Jul 1982 – May 2001 **Academy of Sciences of R. Moldova, Institute of Applied Physics, Chisinau, R. Moldova**
position: **scientific worker & postgraduate, senior (beginning 1996) on theoretical and mathematical physics**
- 16/ Oct 1982 – May 1994 **Joint Institute of Nuclear Research, Dubna, Moscow reg., Russia**
position: **young researcher on gravitational waves**
- 17/ Jun 1982 – Oct 1982 **State University of R. Moldova, Astrophysical Observatory, Chisinau and Lozova-Ciuciuleni, R. Moldova**
position: **engineer and young researcher on astrophysics**

Education, Qualifications, Awards & Travel Grants

Education

- **PhD in theoretical physics, thesis title: “Application of Nearly Autoparallel Maps and Twistor Gauge Methods in Gravity & Condensed States” – University “Alexandru Ioan Cuza” at Iasi, UAIC, Iasi, Romania – Years: Sep 1992 – May 1994**

- **Postgraduate on general relativity and gravitation** ; grade: **postgraduate studies** – “M. Lomonosov” State University, Physics Department – Years: Nov 1984- Nov 1987
- **Degree in high-temperature superconductivity physics**; grade: **second university degree, equivalent to master degree** – “T. G. Shevchenko”, State University, Kiev, Ukraine, Department Radio-Physics – Years: Sep 1988 – Jun 1989
- **Degree in experimental nuclear physics with special education on particle physics and gravity waves**; grade: **university diploma for engineering and physics** – Tomsk Polytechnic University with special programs at the Branch of Moscow State University at Dubna – Years: Sep 1976 – Feb 1982
- **High-school certificate**, grade: **gold medal for excellent education** – Gorbova [Horbova] High School in district Herta (Gertsya), Chernivtsi [Chernivtsi], Ukraine – Year: 1975

Fellowships, Memberships, Honours and Awards

- 2015 DAAD (German Academic Exchange Service) fellowship
- 2013-14 visiting associate researcher at TH-CERN
- 2011-15 project IDEI of the Romanian Government
- 2010 visitor at A. Einstein Institute, Max Planck Institute, Potsdam-Golm, Germany
- 2006-08 visiting research, Fields Institute, Toronto, Canada
- 2005-06 visiting International Professor, Brock University, Canada
- 2001, 2005 California State University at Fresno, Legislative Award
- 2001 visiting professor at the Athens University, Greece
- 2000 DAAD (German Academic Exchange Service) Fellowship
- 1989 former USSR and Russian and Romanian Gravitational Societies
- 1982 university grade with excellence (red diploma)
- 1975 high school certificate with excellence (gold medal)

Short visits/seminars/conferences, or travel grants: Columbia State University (NY, USA, 2016); Un. Leibniz, ITP, Hannover and M. Plank Inst. Physics, Munich (Germany, 2015) Univ. Sapienza, Roma (Italy, 2015); Hebrew Univ. Jerusalem, and Ben-Gurion Univ. Beer-Sheva (Israel, 2015); Prague and Brno (Czech R., 2014); CERN-Switzerland, Poland, Greece (2013); Sweden, Poland, Greece, Estonia, Turkey (2012); UK: UCL and KCL, Norway: Univ. Stavanger; Italy: Univ. Bologna, Spain (2011) Univ. Granada, UAM, ICM, UAB (2010); Germany: ZARM Univ. Bremen and Jacobs Univ. Bremen, AEI MPI and University Leipzig (2010-11); France, Austria-Belgium - Luxembourg: Univ. Vienna-ESI, Mons, Luxembourg; Turkey: Universities: METU, Bilkent, Cankaya (Ankara) and Bogazici, Yeditepe, Bahceshir (Istanbul) (2010); Perimeter Institute, Waterloo (2008), and Fields Institute, Toronto, Canada (2007); Universities in Spain: Cantabria, Santander (2004), Huelva (2004); CSIC, Madrid (2004), Murcia (2004), Zaragoza (2003); Tennessee Technical University, USA (2002), University of Thessaloniki, Greece (2001), Konstanz University, Germany (1999,2000), “I. Newton” Mathematical Institute, Cambridge, UK (1999); ICTP Trieste, Italy (1999); Universities in Poland: Lodz and Warsaw (1998), Torun (1999); Geometric Institute Debrecen, Hungary (1994); a number of Universities in former USSR, Russia, Ukraine Georgia, Armenia, R. Moldova and Romania (1982-2015).

Languages: English (fluent), Romanian (native) and Russian (almost native); beginning: French, Spanish, Portuguese; with a dictionary: the bulk of Slavic and Latin languages. *Computer skills:* Microsoft Word, Latex, Scientific Word, Mathematica, Maple *Hobbies:* Half marathon runner, biking, history of physics

References and full Publication List available on request and in the Internet
