

Curriculum vitae

Personal information

Name: Gabriela-Raluca BLAGA (family name before marriage: MOCANU)
Birth date: September 24, 1986
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Phone: +4 0743-810625
Scientific title: PhD in Physics, PhD in Mathematics
Permanent position: Researcher III, Astronomical Observatory in Cluj-Napoca, Romanian Academy – Cluj-Napoca Branch

Professional course

05.2015 – *Romanian Academy – Cluj-Napoca Branch, Astronomical Observatory*
Researcher III (position secured by competitive examination)

01.2019 – 02.2021 *European Space Agency*
Project manager
ESA Contract No. 4000125989/18/NL/IA *Simulation of magnetic disturbance at the SWARM ASM and VFM location*
References:
Pierre Vogel, PhD, ESA, scientific officer: Pierre.Vogel@esa.int
Thomas Usbeck, AIRBUS science branch: thomas.usbeck@airbus.com

11.2018-10.2020 *Romanian Academy*
Project manager
Research project PD 156 / 2018 PN-III-P1-1.1-PD-2016-0215 *Charged particle trajectories in time variable magnetic field (TraTiVar)*

- 03.2018-11.2020 *Romanian Academy*
Researcher III
 Research project Code: PN-III-P1-1.2-PCCDI-2017-0266, Contract No. 16 PCCDI/01.03.2018 *Institutional capabilities and services for research, surveillance and forecasting of risks from extra-atmospheric space (SAFESPACE)*
- 01.2018 – 02.2019 *European Space Agency*
Project manager
 ESA Contract No. 4000122501/17/NL/LvH/md/03.01.2018, within programme E/0600-03-B-01 General Studies Programme at European Space Agency (ESA), European Space Research and Technology Centre (ESTEC), *Magnetic Field Perturbations by Thermo-Electric Effects – TherMag*.
 References: Bálint Szücs, ESA, scientific officer: Balint.Szucs@esa.int
- 01.2017 – 12.2018 *Romanian Academy – Astronomical Observatory Bucharest*
Researcher III
 Financing contract for execution of projects 118/14.11.2016 PNIII STAR, acronym ASTRES. Project manager: CS I Alin Nedelcu, PhD
- 08.2017 – 07.2018 *Romanian Academy – Cluj-Napoca Branch, Astronomical Observatory*
Researcher III
 Contract 11 PS/20.11.2017 within the programme Sectorial Plan of Ministry of Research and Innovation, acronym ARGOSS (group manager for the Romanian Academy CS I Vlad Turcu, PhD)
- 08.2017 – 07.2018 *Babeş-Bolyai University, Faculty of Physics*
Researcher III
 Grant 181/20.07.2017 of the Ministry of Education and Research, RDI Program for Spatial Technology and Advanced Research - STAR, acronym COMASS
- 07.2015 – 07.2016 *Romanian Academy – Cluj-Napoca Branch, Astronomical Observatory*
Researcher
 Contract ESA **4000114740/15/NL/MM** TELECAL: *Angular Position Management of Galileo Satellite with Telescopes* (group manager for the Romanian Academy CS I Vlad Turcu, PhD)
- 11.2014 – 05.2015 *Romanian Academy – Cluj-Napoca Branch, Astronomical Observatory*
Researcher
 (position secured by competitive examination)
- 09.2014 – 11.2014 *Romanian Academy – Cluj-Napoca Branch, Astronomical Observatory*
Research Assistant
 (position secured by competitive examination)

- 03.2014 – 05.2016 *Babeş-Bolyai University, Faculty of Physics*
Physicist
 Project RDI 72/29.11.2013 *Computational methods in scientific investigations of space*, project manager Assistant Prof. Alexandru Marcu, PhD
- 10.2014 – 02.2017 *Technical University of Cluj-Napoca (UTCN), Faculty of Automatics and Computers*
Associate teaching position (Lecturer)
 Seminar activities for following courses: Linear Algebra, Analytical Geometry, Special Mathematics for Engineers. Teaching languages: English, Romanian
- 10.2013 – 09.2014 *UTCN, Faculty of Automatics and Computers*
Associate teaching position (Lecturer)
 Practicals for courses: Process Modelling, Signals and Systems. Teaching languages: English, Romanian
- 10.2012 – 09.2013 *UTCN, Faculty of Automatics and Computers*
Assistant Lecturer
 Practicals for courses: Process Modelling, Signals and Systems. Teaching languages: English, Romanian
- 10.2012 – 09.2013 *UTCN, Faculty of Automatics and Computers*
Physicist
 Project PN-II-PT PCCA-71/2012 *Integrated Smart Sensor System for Monitoring Strategic Hydrotechnical Structures*, project manager Prof. Daniel Moga, PhD
- 09.2008 – 09.2010 *Babeş-Bolyai University, Faculty of Physics*
Physicist
 Project **CNCSIS 31796 / 23.11.2007** *Theoretical and computational modelling in solar and stellar coronal seismology: connections global-local waves, magnetic fields, variabilities*. Project manager Assistant Prof. Alexandru Marcu, PhD

Formal education

- 10.2013 – 09.2016 **PhD in Mathematics – *magna cum laudae***
 Technical University of Cluj-Napoca (UTCN), Faculty of Automatics and Computers, Department of Mathematics
 Thesis: *Semigroups of operators and associated evolution equations*
 Scientific supervisor: Prof. Ioan Raşa, PhD
- 10.2010 – 03.2013 **PhD in Physics – *summa cum laudae***

Babeş-Bolyai University in Cluj-Napoca, Faculty of Physics, Department of Theoretical and Computational Physics

Thesis: *Stochastic phenomena in astrophysics*

Scientific supervisor: Prof. Néda Zoltán, PhD

Study and examination language: English

10.2008 – 07.2010 **Master of Science in Computational Physics – *valedictorian***

Babeş-Bolyai University in Cluj-Napoca, Faculty of Physics

Study and examination language: English

10.2005 – 07.2008 **Bachelor of Science in Physics – *valedictorian***

Babeş-Bolyai University in Cluj-Napoca, Faculty of Physics

09.2001 – 07.2005 **High school diploma (Bachelor)**

National College „Unirea” in Focşani, Mathematics-Informatics profile

Research stages:

2nd Sem., 2007-2008 Research stage - Erasmus scholarship

Department of Applied Mathematics of the University in Sheffield, UK

1st Sem., 2011-2012 Research stage - PhD scholarship

Department of Theoretical Physics of the Technical University in Wien, Austria

ISI Articles

1. A. Barar, **G. Mocanu**, I. Rasa - Heun equations and combinatorial identities, Constructive Mathematical Analysis, In production 2021
2. **G. Mocanu** - Trajectories of charged particles undergoing Brownian Motion in a time variable magnetic field, Romanian Reports in Physics, volume 72, no 1, article 105 (2020)
3. **G. Mocanu** - Trajectories of charged particles undergoing Brownian Motion in a time dependent magnetic field II. Effect of external parameters, IEEE Transactions on Plasma Science, accepted 12 November 2020
4. B. Danila, **G. Mocanu**, V. Turcu, A. Junge, S. Blaga - Magnetic field created by the thermoelectric effect, IEEE Transactions on Magnetics, published online 16 December 2020, DOI: 10.1109/TMAG.2020.3045342

5. **G. Mocanu** - Mean square displacement and instantaneous diffusion coefficient of charged particles in stochastic motion, *Romanian Astronomical Journal*, 29, 1, 41-57, 2019
6. A. Bărar, **G. Mocanu**, I. Raşa - Heun functions related to entropies, *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A, Matemáticas*, 113, 2, 819-830, 2019
7. A. Bărar, **G. Mocanu**, I. Raşa - Bounds for some entropies and special functions *Carpathian Journal of Mathematics*, 34, 1, 9-15, 2018
8. **G. Mocanu**, I. Raşa – Approximation of C_0 Semigroups Generated by Differential Operators on the Unit Interval, *Numerical Functional Analysis and Optimization*, 38 (2017), 674-682
9. A. Pop, M. Craciun, **G. Mocanu**, C. Vamos - Evidence for quasiperiodicity in orbital period modulation of WW Cygni, *Astrophysics and Space Science*, 362 (2017), 4, 76
10. **G. Mocanu**, I. Raşa - Hormander Representations and Hill Trajectories for Certain Partial Differential Operators, *Mediterranean Journal of Mathematics*, 14 (2017), 1, 32
11. T. Harko, **G. Mocanu** – Electromagnetic radiation of charged particles in stochastic motion. *European Journal of Physics C*, 76, 160 (2016)
12. **G. Mocanu**, I. Raşa – C_0 -semigroups associated with Markov operators. *Mediterranean Journal of Mathematics*, 13 (2016), 1, 353
13. **G. Mocanu** – C_0 -semigroups generated by second order differential operators. *Annales Polonici Mathematici*, 116 (2016), 57
14. B. Dănilă, A. Marcu, **G. Mocanu** – New statistical results on the optical IDV data of BL Lac S5 0716+714. *Research in Astronomy and Astrophysics*, 15 (2015), No. 3, 327-332
15. T. Harko, P. Liang, S.-D. Liang, **G. Mocanu** – Testing the Bose-Einstein Condensate dark matter model at galactic cluster scale. *Journal of Cosmology and Astroparticle Physics*, 027 (2015)
16. B. Dănilă, T. Harko, **G. Mocanu** – Self-organized criticality in a two dimensional cellular automaton model of a magnetic flux tube with background flow. *Monthly Notices of the Royal Academy*, 453, 3 (2015)

17. T. Harko, **G. Mocanu**, N. Stroia – Self-organized criticality in an one dimensional magnetized grid. Application to GRB X-ray afterglows. *Astrophysics and Space Science*, 357 (2015), 1-9
18. T. Harko, C. S. Leung, **G. Mocanu** – Generalized Langevin equation with colored noise description of the stochastic oscillations of accretion disks. *European Physical Journal C*, 74:2900 (2014), 16 pages
19. **G. Mocanu**, A. Pardi, N. Magyar, A. Marcu – Appearance of an accretion disk perturbed by fractional Brownian motion density. *Monthly Notices of the Royal Astronomical Society*, 439 (2014), 3790 – 3797
20. T. Harko, **G. Mocanu** – Stochastic oscillations of general relativistic discs. *Monthly Notices of the Royal Astronomical Society*, 421 (2012), 3102 – 3110
21. **G. Mocanu**, D. Grumiller – Self-organized criticality in boson clouds around black holes. *Physical Review D*, 85 (2012), id. 105022, 8 pages
22. T. Harko, **G. Mocanu** – Cosmological evolution of finite temperature Bose-Einstein condensate dark matter. *Physical Review D*, 85 (2012), id. 084012, 13 pages
23. L. P. Csernai, **G. Mocanu**, Z. Neda – Fluctuations in hadronizing quark gluon plasma. *Physical Review C* 85 (2012), id. 068201, 4 pages
24. **G. Mocanu**, B. Sandor – Rms-flux relation in the optical fast variability data of BL Lacertae object S5 0716+714. *Astrophysics and Space Science* 342 (2012), 147 – 153
25. **G. Mocanu**, A. Marcu – Power spectral distribution of the BL Lacertae object S5 0716+714. *Astronomische Nachrichten*, 333 (2012), 166 – 173
26. **G. Mocanu**, A. Marcu – New approach on the excitation and damping of transversal coronal loop oscillations. *Romanian Reports in Physics*, 62 (2010), 897 – 905
27. **G. Mocanu**, A. Marcu, I. Ballai, B. Orza – The problem of phase mixed shear Alfvén waves in the solar corona revisited, *Astronomische Nachrichten* 329 (2008), 780 – 785

ISI Proceedings

1. B. Danila, A. Marcu, **G. Mocanu** - Dispersion Equation for Stochastically Perturbed MHD Waves. Propagation in Infinite Medium and Thin Flux Tube, *American Institute of Physics Conference Proceedings*, Volume 2071, Article 020011 (2019)

2. T. Harko, A. Marcu, **G. Mocanu** - Radiation emitted by a charged particle undergoing Brownian motion in a magnetic field, AIP HIGH ENERGY GAMMA-RAY ASTRONOMY: 6th International Meeting on High Energy Gamma-Ray Astronomy (2017), DOI: 10.1063/1.4972352
3. C. S. Leung, **G. Mocanu**, T. Harko – Generalized Langevin equation description of the stochastic oscillations of general relativistic disks. Journal of Astrophysics and Astronomy, 35 (2014), 449 – 452
4. A. Pardi, N. Magyar, **G. Mocanu**, A. Marcu – The effect of cooling on sausage and kink oscillation modes in expanding coronal loops. TIM 2012 PHYSICS CONFERENCE, American Institute of Physics (AIP) Conference Proceedings, Eds.: M. Bunoiu, C. Biriş, N. Avram, Vol. 1564 (2013), 194 – 199
5. A. Marcu, **G. Mocanu** – Excitation and damping of transversal coronal loop oscillations. TIM 2010 PHYSICS CONFERENCE, American Institute of Physics (AIP) Conference Proceedings Series, Eds: M. Bunoiu, I. Mălăescu, Vol. 1262 (2010), 39 – 44
6. A. Marcu, **G. Mocanu**, B. Orza – Standing waves in solar periodic structures. EXPLORING THE SOLAR SYSTEM AND THE UNIVERSE, American Institute of Physics (AIP) Conference Proceedings, Eds.: V. Mioc, C. Dumitrache, N. Popescu, Vol. 1043 (2008), 314 – 317

Books

1. A. Marcu, **G. Mocanu**, I. Ballai – *Magnetohidrodinamica plasmelor solare și spațiale. Aplicații în seismologia coronală*. Presa Universitară Clujeană (2010), ISBN 978-973-595-148-1, 436 pages
2. D. Moga, **G. Mocanu**, R. Munteanu – *Vision based measurement and control*. Mediamira Science Publisher, Cluj-Napoca, (2009), ISBN 978-973-713-233-8, 147 pages