

## Indicatori de rezultat

### Brevete

- cerere depusa la OSIM pentru brevet "Antenă multiple-input-multiple-output cu bandă duală pentru benzile de frecvență LTE", A. Badescu, C. Heiman, Universitatea Politehnica Bucuresti
- cerere de breve depusă la OSIM „Sistem pentru transfer de putere prin cuplaj magnetic folosind tehnici rezonante”, F. Rosu, A.M Badescu, Universitatea Politehnica Bucuresti, a201900188, 2019
- cerere de brevet trimisă către OSIM cu titlul „Detector modular hibrid de înaltă rezoluție pentru măsurarea fluxului direcțional de miuoni în aplicații de miuografie”, 2021
- cerere de brevet trimisă către OSIM cu titlul „Stație de monitorizare a radiației ambientale cu elemente multiple de detecție”, 2021

### Diseminare

### Articole

- Observation of inclined EeV air showers with the radio detector of the Pierre Auger Observatory The Pierre Auger Collaboration, JCAP 10 (2018) 026
- Muography applications developed by IFIN-HH , Mitrica B et al. 2018, Phil. Trans. R. Soc. A 377: 20180137.
- Limits on point-like sources of ultra-high-energy neutrinos with the Pierre Auger Observatory, JCAP11 (2019) 004
- Data-driven estimation of the invisible energy of cosmic ray showers with the Pierre Auger Observatory, Pierre Auger Collaboration, Phys. Rev. D 100, 082003
- Probing the origin of ultra-high-energy cosmic rays with neutrinos in the EeV energy range using the Pierre Auger Observatory, Pierre Auger Collaboration, JCAP 10 (2019) 22
- Measurement of the average shape of longitudinal profiles of cosmic-ray air showers at the Pierre Auger Observatory, Pierre Auger Collaboration, JCAP 3 (2019) 18
- Muography applications developed by IFIN-HH, B. Mitrica et al., Philosophical transactions of the royal society a-mathematical physical and engineering sciences 377 (2019) 0137
- Data-driven estimation of the invisible energy of cosmic ray showers with the Pierre Auger Observatory, Pierre Auger Collaboration, Physical Review D 100 (2019) 082003
- Adelaida Heiman, Alina Badescu, Alexandra Saftoiu, "A new Multiple Input Multiple Output V2V automotive antenna for Long Term Evolution band applications", Proc. International Symposium on Fundamentals of Electrical Engineering 2018, INSPEC Accession Number: 18761436, WOS:000480396400073, DOI: 10.1109/ISFEE.2018.8742480, ISBN: 978-1-5386-7211-2, Bucharest, November 1-3 2018.
- „Cosmic rays air showers properties and characteristics of the emitted radio signals using analytical approaches and full Monte Carlo simulations, Paula-Gina Iras, Dragos Hirnea, Alexandru Jipa, Romanian Reports in Physics 72, 301 (2020)
- UHECRs mass composition from Xmax distributions, N. Arsene, O. Sima, The European Physical Journal C 80 (2020) 48
- „Restoration of the azimuthal symmetry of muon densities in extended air showers”, N. Arsene, M. Roth, O. Sima, Astroparticle Physics 121 (2020) 102452
- Search for magnetically-induced signatures in the arrival directions of ultra-high-energy cosmic rays measured at the Pierre Auger Observatory, The Pierre Auger Collaboration, JCAP 06 (2020) 017
- Direct measurement of the muonic content of extensive air showers between  $2 \times 10^{17}$  and  $2 \times 10^{18}$  eV at the Pierre Auger Observatory, The Pierre Auger Collaboration, Eur. Phys. J. C (2020) 80:751
- Cosmic ray anisotropies in right ascension measured by the Pierre Auger Observatory The Pierre Auger Collaboration, The Astrophysical Journal, Volume 891, 142 (2020)
- Features of the energy spectrum of cosmic rays above  $2.5 \times 10^{18}$  eV using the Pierre Auger Observatory, The Pierre Auger Collaboration, Phys. Rev. Lett. 125, 121106 (2020)

- Measurement of the cosmic ray energy spectrum above  $2.5 \times 10^{18}$  eV using the Pierre Auger Observatory, The Pierre Auger Collaboration, Phys. Rev. D 102, 062005 (2020)
- Andrei Gindac, Andrei-Edward Popa, Andrei-Alexandru Ulmamei, Calin Bira, 2021, *Open-source SoC-based Off-the-shelf Industrial-Grade Low-Cost Logic Analyzer*, Romanian Journal of Information Science and Technology Volume 1, Number 1, 2021, 117-126
- Filip Roșu, Alina Bădescu, *Electric and Magnetic Design of a Deployable WPT System for Industrial and Defense UAV Applications*, Journal of Power Electronics, Status: In Revision
- A. Săftoiu, A. Gherghel-Lascu, A Bădescu, N. Rotar, V. Arad, *Evaluation of inhomogeneities in underground structures using non-invasive muon scanning with pixelated detectors*, articol trimis spre publicare în revistă ISI din zona galbena, status: In Revision

## Conferinte

- Conferinta Cosmic-ray muography, 14-15 Mai 2018, Kavli Royal Society Centre, UK, poster, B. Mitrica et al. "Muography applications developed by IFIN-HH"
- Adelaida Heiman, Alina Badescu, Alexandra Saftoiu, "A new Multiple Input Multiple Output V2V automotive antenna for Long Term Evolution band applications", Proc. International Symposium on Fundamentals of Electrical Engineering 2018, ISBN: 978-1-5386-7211-2, Bucharest, November 1-3 2018
- Vlad Moise, Alina Badescu, "An amplifier design for cosmic particles radio detectors", Proc. The 18th Mediterranean Microwave Symposium, ISBN: 978-1-5386-7132-0, Istanbul, pp. 369 - 371, 31 October - 2 November 2018
- F. Rosu, A. Badescu, B. Rusu - Analysis and Optimization of an Inductive Wireless High Power Transfer System, 9th SPIE Conference on Advanced Topics in Optoelectronics, Microelectronics, and Nanotechnologies (ATOM-N 2018), 23-26 August 2018, Constanta, Romania, SPIE Tracking No. OMN100-100
- Carpathian Summer School of Physics 2018, Sinaia, Romania, cu prezentarea orala invitata "Overview of the Pierre Auger Observatory dedicated to the study of cosmic rays", A. Saftoiu, care va fi publicata in AIP Physics Proceedings
- NIC 2018, L'Aquila, Italia, 24-29 Iunie, 2018, cu poster in calitate de co-autor pentru lucrarea "Women Scientists who made nuclear astrophysics" by Hampton, C.V. Isar, P.G. et al., (poster, 5 pages to appear in Springer Proceedings in Physics (Proc. of Intl. Conf. "Nuclei in the Cosmos XV", LNGS Assergi, Italy, June 2018), eprint arXiv:1809.01045
- ISAPP 2018: LHC meets cosmic rays (poster by H. Dragos and G. Isar "An EAS browser display"), CERN, Geneva, Elvetia, 28 Oct - 2 Noiembrie, 2018; proiect component 3
- Adelaida Heiman, Alina Badescu, "A Novel Design and Simulation of a Ku Broadband Double Ridged Guide Horn Antenna for Satellite Communications", Proc. Photonics & Electromagnetics Research Symposium 2019, Rome, June 17-20 2019.
- Adelaida Heiman, Alina Badescu, "Design of a conventional horn antenna for Ku band", Proc. International Workshop on Antenna Technology (iWAT 2020), Bucharest, February 25-28 2020.
- Sub-Resolution Multipath Mitigation in Radar Transponders by Range Compression and Adaptive Filtering - Filip Rosu, Andrei Anghel, Silviu Ciochina; ISSCS 2019, Iasi, Romania, 11-12 July 2019. INSPEC: 18924420; ISBN: 978-1-7281-3896-1; [10.1109/ISSCS.2019.8801726](https://doi.org/10.1109/ISSCS.2019.8801726)
- Analysis and optimization of an inductive wireless high power transfer system - Filip Rosu, Alina Badescu, Bogdan Rusu; ATOM 2018, Constanta, Romania, 20-23 August, Proc. SPIE 10977; WOS:000458717900029; ISBN:978-1-5106-2614-0; <https://doi.org/10.1117/12.2324454>
- F. Rosu, 2019, Improving the Autonomy of UAV Systems: A Deployable WPT System for Industrial and Defense UAV Applications, IEEE Transactions on Vehicular Technologies (submitted)
- Anghel, A. Badescu, V. Dedu, N. Rotar, 2019, Geophysical measurements performed at Targu Ocna salt mine to evaluate subsurface homogeneity, trimis la conferinta intl. iwat 2020
- M. Antonescu, C. Bira, 2019, DISCRETE GRAVITATIONAL SEARCH ALGORITHM (DGSA) APPLIED FOR THE CLOSE-ENOUGH TRAVELLING SALESMAN PROBLEM, prezentat la conf. ISI, International Semiconductor Conference (CAS) (BEST PAPER AWARD)
- Sesiunea Stiintifica Anuala a Facultatii de Fizica, Universitatea Bucuresti, 21 iunie 2019, "Cosmic rays air showers properties and characteristics of the emitted radio signals using analytical

approaches and full Monte Carlo simulations”, P. G. Isar, D. Hirnea, A. Jipa; articol in Press, Rom. Rep. in Phys.

- Adelaida Heiman, Alina Badescu, „Circularly Polarized Pyramidal Horn Antenna for Ku Band”, The 8th Annual IEEE International Conference on Wireless for Space and Extreme Environments (WISEE 2020), October 12-14 2020. Lucrarea va fi publicata în IEEE Xplore
- Catalina-Daiana Tomescu, Alina-Mihaela Badescu, „A software platform for monitoring radiation detection systems”, 12th International Conference on Electronics, Computers and Artificial Intelligence (ECAI 2020), Bucharest, June 25-27 2020. Lucrarea va fi publicata în IEEE Xplore
- Workshopul AERA online (5-9 Octombrie 2020), "Highlighted elementary features for a sample of simulated radio signals by using a hexagonal detection area chosen inside AERA-153", G. Isar, D. Hirnea, 2020
- EGU General Assembly 2020, Demetrescu, C. and Dobrica, V.: Length of day fluctuations at long and short timescales. Geomagnetic drivers, Online, 4–8 May 2020, EGU2020-13127, <https://doi.org/10.5194/egusph>, 2020
- EGU General Assembly 2020, Stefan, C., Dobrica, V., and Demetrescu, C.: Decomposing the geomagnetic field: oscillation modes and characteristics, Online, 4–8 May 2020, EGU2020-16408, <https://doi.org/10.5194/egusph>, 2020
- International Conference of the NUST Mining Institute, Victor Arad, Marian Ticu, Sorin Popescu, Liviu Popa, Daniel Diaconescu, Dorin Dragan, Conferința on line, *Research on storage of energy in underground caves*, Moscova, 20-22.10.2020 online, lucrarea va fi publicata in Proceeding of Conference in 2020-2021
- International Conference of the NUST Mining Institute, Moscova, Nicolae Iliș, Radu Sorin Mihai, Victor Arad, Susana Arad, Iulian Offenbergh, *Mining geoecology and geotechnologies - conceptualization and evaluation elements*, conferinta online, 20-22.10.2020. Lucrarea va publicata in Proceeding of Conference in 2020-2021

Datorita pandemiei COVID-19 unele conferinte, în special în domeniul razelor cosmice, au fost amanate pentru anul 2021 sau anulate (e.g. ARENA2020, Spania, ECRS2020, Olanda, UHECR2020, Moscova).

#### Outreach:

- participare la Sci+Fi Fest “100 de Ani de Cercetare Romaneasca”, Biblioteca Nationala a Romaniei, Bucuresti, 15-16 septembrie 2018 (public talk Isar, P.G); <https://stiintasitehnica.com/scififest-2018/>
- participare la FameLab hall of Science, in cadrul evenimentului Noaptea Cercetatorilor Europeni, Promenada Mall, 28 sept, 2018 (public talk Isar, P.G); <http://noapteacercetatorilor.ro/bucuresti/>
- participare la Space Talks “Odiseea Spatiala in Romania” (<https://spacetalks.net/event/odiseea-spatiala-in-romania/>), invitat G. Isar, 28 noiembrie 2018 la Libraria Carturesti Verona, Bucuresti.
- Outreach-Educatie: workshop cu profesori din Jud. Neamt la ISS – 28 martie 2019 (RRC, Interviu cu Gina Isar, Realizator Mihaela Ghita, <https://radioromaniacultural.ro/profesorii-de-fizica-din-judetul-neamt-in-vizita-pe-platforma-magurele>),
- AERA meeting, KIT, Germany, 30 Sept. – 3 Oct., 2019, “A potential contribution to RD” (prezentare orala, P. G. Isar)
- JENAS seminar, 13-16 Octombrie 2019, Orsay, “Education and Outreach activities on Astroparticle Physics in Romania” (poster, P. G. Isar)
- Observatorul Pierre Auger sărbătorește anul acesta 20 de ani de la înființare!, Radio Romania Cultural, Stiinta in cuvinte potrivite, Interviu cu Gina Isar, realizator Corina Negrea, <https://radioromaniacultural.ro/observatorul-pierre-auger-sarbatoreste-anul-acesta-20-de-ani-de-la-infiintare/>, 2019
- Scoala Altfel la ISS – 14-19 Aprilie 2019,
- AstroFest la Parke Lake Mall Bucuresti – 25 Mai 2019,
- Sci+Fi Fest la Parke Lake Mall Bucuresti – 14 Sept 2019,
- Noaptea Cercetatorilor Europeni in Parcul Lumea Copiilor – 27 sept, 2019,
- workshop cu elevi/profesori ERASMUS la ISS – 24 Oct. 2019

- Scoala Altfel, 25/2/2020
- Noaptea Cercetătorilor, 27/11/2020
- Interviu la Radio Guerrilla si Radio Romania Cultural, 2020
- Dragos Marin, Radioactivitatea în viața de zi cu zi. Seminar dedicat sarbatoririi Zilei Internationale a Marii Negre, organizat sub egida Universitatii Maritime Constanța si al Clusterului Transfrontalier al Energiei Verzi Constanta-Dobrich, 2019
- Creanga Silvia-Madalina, Co-autori: M. Tanase, E. Stoica, V. Patrascu, D. Marin, Deseurile solide si mediul marin. Seminar dedicat sarbatoririi Zilei Internationale a Marii Negre, organizat sub egida Universitatii Maritime Constanța si al Clusterului Transfrontalier al Energiei Verzi Constanta-Dobrich, 2019
- Interviu acordat de G. Isar Institutului Francez: 4 Februarie 2021
- Interviu acordat de G. Isar la Radio Romania Cultural: 1 Martie 2021
- FUZION AIR: artist -scientist talk online, 16 Martie 2021 (G. Isar - ISS, C. Ciuclea - artist)

#### **Notă internă a colaborării Pierre Auger,**

- Nota internă în cadrul Colaborării Pierre Auger, GAP 2020-008, *Performance estimation of a hexagonal antenna array*, A. Saftoiu, T. Huege, iunie 2020
- Nota internă în cadrul Colaborării Pierre Auger (GAP2021\_016), *The Cosmic Particle Rain – User’s Manual*, G. Isar, D. Hîrnea
- Nota internă în cadrul Colaborării Pierre Auger (GAP2021\_017), *The response of a model hexagonal detectors area to radio signals from ultra high energy cosmic rays air showers*, G. Isar, D. Hirnea

#### **Remote shifts în cadrul Observatorului Pierre Auger:**

- Auger Remote shifts FD și LIDAR efectuate la ISS-Magurele, 1 în 2020 și 1 în 2021
- remote shifts în cadrul sub-ansamblului AERA: 1 în 2019, 8 în 2020 și 5 în 2021

#### **Prototipuri și detectori dezvoltati**

Prototip detector pentru aplicații de miuografie – TRL5 (proiect component 1)

Prototip stație de detectie individuala – TRL5 (proiect component 2)

Detector pentru inregistrarea fluxului direcional de miuoni – TRL5 (proiect component 3)

Stație de detectie a radiatiei – TRL5 (proiect component 4)