Centro de Matemática e Aplicações
Universidade da Beira Interior

CMA-UBI

Report 2025

Contents

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CMA-UBI
Report
2025

1 Summary

CMA-UBI is a research unit that conducts noteworthy scientific work in several areas of mathematics, including its applications and theoretical physics. Its main guidelines are as follows:

1. Contribute to the advancement of scientific knowledge, constituting an international reference;
2. Enhance the participation in national and international research networks and partnerships;
3. Develop multidisciplinary work;
4. Promote and assist thoroughly in graduate as well as post-graduate training;
5. Endorse a strategy to bolster the career of its researchers;
6. Increase public awareness of mathematics and applications, namely in the region of Beira Interior;
7. Engage actively in the current societal challenges;
8. Embrace programs applying mathematics in other domains, namely industry.

CMA-UBI is constituted by two research groups: (*i*) Physics and Mathematical Modeling and (*ii*) Mathematics. In general terms, CMA members are distributed into integrated members, collaborators and students; integrated members fulfil specific publication thresholds, as determined by the Scientific Council in 2018.

Although the central core of its academic activity is fundamental research, some of its integrated members, especially in statistics, collaborate regularly with other research units in UBI that address different subjects; a few also collaborate with other institutions: CICS (Health Sciences Research Centre), CIDESD (Centre in Sports, Health and Human Development) and LIAAD (Laboratory of Artificial Intelligence and Decision Support of INESC Porto).

CMA-UBI endeavours to contribute to the success of several mathematics and physics programs at the University of Beira Interior, including PhD degrees and post-doctoral studies. Besides an unreserved commitment to supervising and mentoring, it also acquires books for the UBI library, purchases software licenses according to the needs of students, teachers and researchers, obtains various types of computer equipment, and

broadly supports multiple outreach activities.

Furthermore, CMA-UBI also organizes regular seminars and international scientific meetings. Most are provided in collaboration with internationally renowned visitors who work with our students and their supervisors, enthusing them to explore new and innovative lines of investigation.

CMA-UBI is hosted by the Faculty of Sciences of the University of Beira Interior. Offices and classroom facilities are made available by the Faculty, which also assists in managing budgets plus contributing additional computational support. Therefore, the Faculty (and UBI) provide an institutional framework that conveys CMA's successful realization.

Further particulars can be found on CMA-UBI website URL `http://www.cmaubi.ubi.pt/`.

2 Structure and Groups

2.1 Directive Board

Coordinator:

Paulo Rodrigues Lima Vargas Moniz (ORCID: 0000-0001-7170-8952)

Vice-Coordinator:

Luísa Maria Jota Pereira Amaral (ORCID: 0000-0002-9068-4607).

Principal researcher of Physics and Mathematical Modeling Group:

João Pedro de Jesus Marto (ORCID: 0000-0003-3974-9177).

Principal researcher of Mathematics Group:

César Augusto Teixeira Marques da Silva (ORCID: 0000-0001-6189-8836).

2.2 Physics and Mathematical Modeling Group

The main goal of this group is to develop high-quality research, assisted through intertwined cooperation, in current and emerging research areas involving probability theory and stochastic processes, statistics, numerical analysis, partial differential equations and theoretical physics.

Integrated members:

Ana Paula André Martins
(Probability theory and stochastic processes)
[ORCID: 0000-0002-3908-821X]

Célia Maria Pinto Nunes
(Statistical inference/Probability theory)
[ORCID: 0000-0003-0167-4851]

Dário Jorge da Conceição Ferreira
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Helena Maria Simões Ferreira
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[ORCID: 0000-0001-9392-7259]

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Sandra Maria Bargão Saraiva Ferreira
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[ORCID: 0000-0002-9209-7772]

João Pedro de Jesus Marto
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[ORCID: 0000-0003-3974-9177]

João Pinheiro da Providência e Costa
(Quantum theory)
[ORCID: 0000-0001-9361-1457]

Seyed Meraj Mousavi Rasouli
(Gravitation and Cosmology)
[ORCID: 0000-0003-3455-1954]

Paulo Rodrigues Lima Vargas Moniz
(Gravitation and Cosmology)
[ORCID: 0000-0001-7170-8952]

Rui Jorge Mendes Robalo
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[ORCID: 0000-0001-8239-9411]

Rui Manuel Pires Almeida
(Numerical analysis/Partial differencial equations)
[ORCID: 0000-0003-3976-1571]

José Carlos Matos Duque
(Numerical analysis/Partial differencial equations)
[ORCID: 0000-0002-2347-639X]

Paulo Jorge dos Santos Pinto Rebelo
(Numerical analysis/Partial differential equations)
[ORCID: 0000-0002-7194-4004]

Collaborators:

Alexey S. Koshelev
(high energy physics)
[Shangai University, China]
[ORCID: 0000-0002-6060-7942]

Mariam Bouhmadi-López
(Gravitation and Cosmology)
[University of Basque Country, Spain]
[ORCID: 0000-0002-1529-1889]

Manuel Fernando Ferreira da Silva
(Physics)
[ORCID: 0000-0001-8132-1321]

Sandra da Costa Henriques Soares
(Physics)
[ORCID: 0000-0002-6401-5290]

Sravan Kumar
(Gravitation and Cosmology)
[University of Portsmouth, UK]
[ORCID: 0000-0002-3126-8195]

Yaser Tavakoli
(Gravitation and Cosmology)
[Gilan University, Iran]
[ORCID: 0000-0003-0099-5100]

Imanol Albarran
(Gravitation and Cosmology)
[University of Basque Country, Spain]
[ORCID: 0000-0003-4278-9372]

Clara Margarida Pisco Viseu
(Probability theory and stochastic processes)
[Polytechnic Institute of Coimbra]
[ORCID: 0000-0001-9906-276X]

João Renato Caramona Sebastião
(Probability theory and stochastic processes)
[Polytechnic Institute of Castelo Branco]
[ORCID: 0000-0003-4175-010X]

Maria Cristina Canavarro Teixeira
(Statistics)
[Polytechnic Institute of Castelo Branco]
[ORCID:0000-0002-8534-9484]

Pedro Mendes Ferrão Simões Patrício
(Statistics)
[ORCID: 0000-0001-6516-7870]

Silvério Simões Rosa
(Differential equations)
[ORCID: 0000-0001-5153-4879]

Patrícia Antunes
(Statistics / Probability theory)
[ORCID:0000-0002-9440-6380]

Luis José Maia Amoreira
(Physics)
[ORCID: 0000-0001-9139-0216]

Phd Students :

Kwaku Opoku-ameyaw
(Statistical inference/Probability theory)

Daniel Oliveira
(Gravitation and Cosmology)

MSc Students :

Íris Almeida Rocha
(Probability Theory and Stochastic processes)

2.3 Mathematics Group

The main goal of this group is to develop fundamental research in mathematics. The members' research interests include linear and multilinear algebra, associative and nonassociative rings and algebras, differential geometry, dynamical systems and ergodic theory, ordinary differential equations, partial differential equations, and systems theory and control.

Integrated members:

António Jorge Gomes Bento
(Dynamical systems/Ordinary differential equations)
[ORCID: 0000-0003-4949-098X]

César Augusto Teixeira Marques da Silva
(Dynamical systems/Ordinary differential equations)
[ORCID: 0000-0001-6189-8836]

Helder Soares Vilarinho
(Dynamical systems/Ergodic theory)
[ORCID: 0000-0002-9822-5341]

Sandra Cristina de Pinto Vaz
(Dynamical systems/Ergodic theory)
[ORCID: 0000-0002-1507-2272]

Alberto Manuel Tavares Simões
(Partial differential equations)
[ORCID: 0000-0002-4772-4300]

Ana Catarina dos Santos Carapito
(Control theory)
[ORCID: 0000-0002-5868-6266]

Deolinda Isabel da Conceição Mendes
(Algebra)
[ORCID: 0000-0002-4920-4915]

Henrique José Freitas Cruz
(Linear and multilinear algebra)
[ORCID: 0000-0003-2941-3194]

Ilda Carla Mendes Inácio
(Linear and multilinear algebra)
[ORCID: 0000-0002-0795-8524]

Ivan Kaygorodov
(Non-associative algebras)
[ORCID: 0000-0003-2084-9215]

Patrícia Damas Beites
(Nonassociative algebras/Linear and multilinear algebra)
[ORCID: 0000-0003-0266-7055]

Rogério Pedro Fernandes Serôdio
(Linear and multilinear algebra)
[ORCID: 0000-0002-8911-245X]

Maria das Neves Vieiro Rebocho
(Orthogonal Polynomials/Special Functions)
[ORCID: 0000-0002-5004-6758]

Nuno Miguel Ferreira Correia
(Differential geometry)
[ORCID: 0000-0001-9376-6205]

Rui Miguel Nobre Martins Pacheco
(Differential geometry)
[ORCID: 0000-0001-9578-2380]

Sérgio Manuel Moço Nunes Mendes
(Topological groups/Lie groups)
[ORCID: 0000-0003-2950-5056]

Pedro Jorge Duarte Gil Morais
(Differential Geometry)
[ORCID: 0000-0002-7469-4485]

José Carlos Alves Martins Aleixo
(Control theory)
[ORCID: 0000-0002-8244-7978]

Kobiljon Abdurasulov
(Non-associative algebras)
[ORCID: 0009-0003-5135-508X]

Collaborators:

Mário Júlio Pereira Bessa da Costa
(Dynamical Systems)
[Universidade Aberta]
[ORCID: 0000-0002-1758-2225]

Cristina Maria Gomes Tomás da Costa Ribeiro
(Dynamical Systems)
[Polytechnic Institute of Viseu]

Gastão Henrique Gonçalves Bettencourt
(Dynamical Systems)
[ORCID: 0000-0003-1223-0631]

Joaquim Manuel Pereira Mateus
(Dynamical Systems)
[Polytechnic Institute of Guarda]
[ORCID: 0000-0002-4677-2896]

Isabel Maria Romano da Cunha
(Algebra)
[ORCID: 0000-0002-7069-2941]

Sodnomkhorloo Tumurbat
(Algebra)
[University of Mongolia]

Manuel Almeida Silva
(Number Theory)
[Nova University of Lisbon]
[ORCID: 0000-0002-9061-3497]

Phd Students:

Augusto Veríssimo Víctor dos Santos
(Modelos compartimentais e suas aplicações em Biomatemática)

Teresa da Conceição Mazissa Zinga
(Dynamical Systems)

Kseniia Vyatkina
(Non-associative algebras)

Andrei Kukharev
(Non-associative algebras)

Evaristo José das Mangas
(Algebra)

Jacinto Cumolehã
(Tópicos em teoria dos operadores bicomplexo)

Calunga Florentino Manuel
(Geometria e Topologia das subvariedades)

3 Main activities and results - Summary

CMA-UBI has organised several regular seminars plus a series of short courses during the appraisal period.

Several invited speakers and visitors with a recognized international reputation have been hosted; some collaborate directly with CMA members. The organization of various national and international scientific meetings has also been widely supported by CMA-UBI.

Members of CMA have been involved in international projects and partnerships;

This was part of a successful strategy to promote and increase internationalization, namely the recognition of the work developed in CMA, namely its international impact.

CMA-UBI's list of publications indicates that the activity of all integrated members for the appraisal period amounted to 70 ISI/Scopus articles. The average of articles with Q1 or Q2 (SJR) is about 70 %.

Currently, 11 PhD students in mathematics and physics are supervised by CMA members.

Among several contributions made by members of CMA in 2025, we refer to the following:

Physics and Mathematical Modeling Group: Probability Theory and Stochastic Processes (extreme value theory), Statistics (inference in linear models), Numerical Analysis of Partial Differential Equations, Theoretical Physics (gravitation and cosmology).

1. Regarding the appraisal period (2025), CMA-UBI researchers engaged in Theoretical Physics have focused on a series of research lines. Namely quantum field theory in curved spaces and fractional calculus.

2. During 2025, the Differential Equations and Numerical Analysis group conducted studies on diverse topics.

3. The research in Extreme Value Theory (EVT) conducted by three integrated members of CMA, Helena Ferreira, Luísa Pereira and Ana Paula Martins, during the period 2025, has been wide-ranging, investigating probabilistic and statistical aspects of extreme values in univariate, multivariate and spatial settings.

4. Within 2025, statisticians dedicated their efforts to a broad spectrum of studies, all aimed at advancing the field of statistical inference in linear models.

Group of Mathematics: Dynamical Systems and Ergodic Theory (non-uniform hyperbolicity, non-autonomous systems), Differential Geometry (harmonic maps), Algebra (linear and multilinear algebra, associative and nonassociative algebras).

1. During 2025, CMA-UBI researchers engaged in Analysis have dedicated their efforts to a diverse array of topics, including dynamical systems and ergodic theory, qualitative theory of difference and differential equations, both ordinary and partial, orthogonal polynomials, as well as applications to models arising from epidemiology, biology, and economics.

2. In Differential Geometry, harmonic maps are the critical points of a particular variational problem arising in Riemannian geometry. They are a natural generalization of important classical objects in differential geometry, such as geodesics and minimal surfaces.

3. In Algebra, during 2025, CMA-UBI researchers engaged in Algebra have dedicated their efforts to various topics, including associative and non-associative algebras and Poysson-type algebras.

	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Q1	11	18	27	18	20	19	27	25	27	26	23
Q2	14	11	13	12	15	20	20	29	15	26	27
Q3	6	4	5	8	7	17	9	11	7	9	14
Q4	0	3	1	2	0	1	0	4	3	1	4
MTP	31	33	39	33	23	34	37	57	43	47	52
Other areas	0	3	7	7	19	23	19	12	9	15	19
Q1 + Q2	25	29	40	30	35	39	47	54	42	52	50
Total	31	36	46	40	42	57	56	69	52	62	71

Table 1: Publications by quartile (SJR) and by discipline, per year (Nb. MTP denotes Mathematics and Theoretical Physics)

4 Projects and Funding

[1] CMA-UBI UIDB/00212/2025 (FCT). Project duration: 2025-2029.

[2] CMA-UBI UIDP/00212/2020 (FCT). Project duration: 2025-2029.

[3] FCT No 1379021870/2024-25.; Title: FCT MOBILITY, 3.622,00 C; Research visit of Ivan Kaygorodov to the University of Bari (Italy) is supported.

[4] FCT No 1347597976/2024-25; Title: FCT MOBILITY, 2.765,00 C; Research visit of Abror Khudoyberdiyev (National University of Uzbekistan, Uzbekistan) to UBI is supported.

[5] FCT No 2023.08031.CEECIND; Title: New perspectives in Poisson-type algebras

[6] FCT No 2023.08952.CEECIND; Title: Algebraic and geometric classification of nilpotent non-associative algebras

4.1 Participations of CMA members in projects

[1] Célia Nunes em "Aliança europeia UNITA - Universitas Montium" Projeto: 101124853 – UNITA – ERASMUS-EDU-2023-EUR-UNIV Agência de Financiamento: European Education and Culture Executive Agency (EACEA) Duração: 48 meses (início 2-11-2023)

[2] P. Moniz in COST Actions CA23130 (Bridging high and low energies in search of quantum gravity (BridgeQG)) and CA23115 (Relativistic Quantum Information (RQI)).

[3] Luísa Pereira integrates the team of UBI Affiliated Center of Cochrane Portugal. URL `https://portugal.cochrane.org/equipa-0`

[4] Jorge Gama integrates the team of UBI Affiliated Center of Cochrane Portugal. URL `https://portugal.cochrane.org/equipa-0`

[5] S. Ferreira in CA21160 Non-globular proteins in the era of Machine Learning Start: 25 October 2022 End: 24 October 2026

[6] S. Ferreira in CA121169 Information, Coding and Biological Function, the Dynamics of Life (DYNALIFE). Start: 19 September 2022 End: 18 September 2026

[7] P. D. Beites, Participação no Projeto PID2021-123461NB-C22 – Estructuras Algebraicas y su Relevante Papel en Teoría de la Información, 2022-, como Membro Colaborador do Grupo de Investigación en Álgebra, Codificación y Criptografía, Universidad de Oviedo, Investigadores Responsáveis: Consuelo Martínez López e Ignacio Fernández Rúa. 34969 euros

[8] P. D. Beites, Participação no Projecto UIDB/00194/2020, 2023-, como Membro Colaborador do Centro de Investigação em Didática e Tecnologia na Formação de Formadores, Universidade de Aveiro, Coordenação do Grupo GI2 - Ciência, Tecnologia e Inovação: Isabel Malaquias (2023-).

[9] S. Ferreira is member of CA18232 Mathematical models for interacting dynamics on networks, WG5 - Numerical methods and applications

5 Training

5.1 PhD theses defended: Mathematics and Theoretical Physics

[1] Tese: "Equações diferenciais biharmónicas evolutivas com crescimento não standard". Ano de conclusão 2025. Resultado final: Aprovado com Distinção. Aluno: Willian dos Santos Panni. Orientador: José Duque, co-orientador: Jorge Ferreira (Univ. Federal Fluminense, Brasil).

[2] Tese: "Convergence of asymptotic systems with unbounded delays with applications to Cohen-Grossberg neural networks and Lotka-Volterra systems". Ano de conclusão: 2025. Resultado final: aprovado com distinção. Aluno: Ahmed Osama Mohamed Sayed Sayed Elmwafy. Orientador: César Silva, co-orientador: José Joaquim Martins Oliveira (Univ. Minho, Portugal).

[3] Tese: "Conformal minimal immersions of constant curvature of Riemann surfaces into symmetric spaces and flag manifolds". Ano de conclusão: 2025. Resultado final: Aprovado com distinção. Aluno: Mehmood Ur Rehman. Orientador: Rui Pacheco.

[4] Tese:"Post-inflationary effects in primordial black hole formation and scalar-induced gravitational waves.". Ano de conclusão: 2025. Resultado final: Aprovado com distinção. Aluno: Daniel del Corral Martínez. Orientador: João Marto, co-orientadores: Korumilli Sravan Kumar (ICG - Univerity of Portsmouth) e Javier Olmedo Nieto (University of Granada).

5.2 PhD theses defended: Other areas

[1] Tese: "Content Storage and Distribution based on Mobile Cloud Computing". Ano de conclusão: 2025. Aluno: Pedro Rosa. Orientadores: Mário Freire and Rogério Serôdio. Doctoral thesis in Engineering and Computing Science, Universidade da Beira Interior.

5.3 PhD theses in progress: Mathematics and Theoretical Physics

[1] Andrei Kukharev "Conservative algebras" Supervisor: Ivan Kaygorodov. Doctoral thesis in Mathematics and Applications, Universidade da Beira Interior.

[2] Kseniia Viatkina "Gerstenhaber algebras", Supervisor: Ivan Kaygorodov. Doctoral thesis in Mathematics and Applications, Universidade da Beira Interior.

[3] Evaristo Mangas. Contribuições para a Teoria dos Permanentes. Supervisor: Henrique Cruz. Doctoral thesis in Mathematics and Applications, Universidade da Beira Interior.

[4] Teresa Zinga. Topics in Semigroups and Semifields. Supervisors: Gastão Bettencourt and Sérgio Mendes (ISCTE, CMA). Doctoral thesis in Mathematics and Applications, Universidade da Beira Interior.

[5] Kwaku Opoku-Ameyaw. Rank and related tests for grouping factor levels. Application to cocoa breeding. Supervisors: Célia Nunes and Manuel Esquível (UNL). Doctoral thesis in Mathematics and Applications, Universidade da Beira Interior.

[6] Mykola Khrypchenko. Transposed Poisson strucutres. Supervisor: Ivan Kaygorodov. Doctoral thesis in Mathematics and Applications, Universidade da Beira Interior

[7] Nurken Smadyarov (Suleiman Demirel University, Kazakhstan), "Varieties of mono and binary Zinbiel algebras". Supervisors: Nurlan Ismailov and Ivan Kaygorodov.

[8] Calunga Florentino Manuel , (Geometria e Topologia das subvariedades), Tema: hipersuperfícies com curvatura média constante, Supervisors: Pedro Morais and Marco Petrúcio Cavalcante (Univ. Federal Alagoas, Brasil)

[9] Jacinto Cumoleha, (Tema: Tópicos em teoria dos operadores bicomplexos), Supervisors: Gastão Bettencout and Sérgio Mendes

[10] Augusto Veríssimo dos Santos, (Tema: Modelos compartimentais e suas aplicações em Biomatemática), Supervisors: Sandra Vaz and Delfim Torres.

[11] Márcia Silva, (título a definir), Supervisors: Sandra Vaz and Delfim Torres, Doctoral thesis in Applied Mathematics, MAP-PDMA - joint Doctoral Program in Applied Mathematics of Universities of Minho, Aveiro and Porto.

5.4 PhD theses in progress: other areas

[1] Vânia Maria Mocho de Bastos Couto, (Tema:O Multiplano na construção de práticas pedagógicas inclusivas: Necessidades de formação de professores), Supervisor: Ema Patrícia de Lima Oliveira, Cosupervisor: Patrícia Damas Beites. Doutoramento em Educação, Universidade da Beira Interior.

5.5 Master Theses defended

[1] Abrão Beneditus José Irenia Marques. Arthritis Classifier with Functional Data. Supervisors: Jorge Gama and Aurélio Faria (CoA). Master Degree in Mathematics and Applications, University of Beira Interior, 07.11.2025.

[2] Íris Almeida Rocha. Madograms in max-stable random fields — Theory and Application. Supervisor: Luísa Pereira Amaral. Master Degree in Mathematics and Applications, University of Beira Interior, 25.07.2025.

5.6 Master Theses defended (under co-supervision of members of CMA)

[1] Teresa Raquel Freitas Frias Rodrigues. Valor preditivo de marcadores inflamatórios no diagnóstico de deiscência anastomótica, em cirurgia de resseção gástrica. Supervisors: Liliana Duarte, João Luís Penela (CoA) and Jorge Gama (CoA). Integrated Masters Degree in Medicine, University of Beira Interior, 11.06.2025.

[2] Joana Jesus Aires. Adesão ao autocuidado, sintomatologia psicopatológica e perceção da qualidade de vida em indivíduos com Diabetes Mellitus tipo 2. Supervisors: Paula Carvalho, Cláudia Silva (CoA) and Jorge Gama (CoA). Integrated Masters Degree in Clinical and Health Psychology, University of Beira Interior, 26.11.2025.

[3] Vasco Afonso Pinto da Fonseca. Avaliação da literacia e crenças sobre saúde mental e a procura de apoio psicológico em alunos da Universidade da Beira Interior. Supervisors: Paula Carvalho, Ana Torres (CoA) and Jorge Gama (CoA). Integrated Masters Degree in Clinical and Health Psychology, University of Beira Interior, 13.11.2025.

[4] Beatriz Isabel Gonçalves de Jesus. Sintomatologia Psicopatológica em estudantes universitários: Um estudo na Universidade da Beira Interior. Supervisors: Paula Carvalho, Ana Torres (CoA) and Jorge Gama (CoA). Integrated Masters Degree in Clinical and Health Psychology, University of Beira Interior, 03.12.2025.

[5] Pedro Ruas. Assessment of Clinical Reasoning in the Medical Course. Supervisors: Isabel Neto and Célia Nunes (CoA). Integrated Masters Degree in Medicine, University of Beira Interior,

5.7 Other

[1] Orientação de Projeto Final de Licenciatura - monografia. Catarina Alexandra Almeida Moreira. Números de Geonardo. Orientadora: Patrícia D. Beites. Licenciatura em Matemática e Aplicações, Universidade da Beira Interior, 2024/2025.

[2] Orientação de Projeto Final de Licenciatura - monografia. Beatriz Tavares Valente. A Transformada de Mellin. Orientador: César M. Silva. Licenciatura em Matemática e Aplicações, Universidade da Beira Interior, 2024/2025.

[3] Orientação de Projeto Final de Licenciatura - monografia. Catarina Isabel Pereira dos Santos. Modelos de Lotka-Volterra, cooperativos e competitivos bidimensionais. Orientador: César M. Silva. Licenciatura em Matemática e Aplicações, Universidade da Beira Interior, 2024/2025.

6 Hosted researchers

6.1 Post Doctoral

- Thiago Beirigo Lopes . Plano de Trabalho: Elaboração de uma sala para laboratório de matemática na formação de licenciados em Matemática no IFMT: Uma visita técnica à Universidade da Beira Interior em Portugal. Pós-Doutoramento em Matemática e Aplicações, Universidade da Beira Interior. Orientadora: Patrícia Beites.

6.2 FCT Researchers

- Ivan Kaygorodov. CEEC-6th Researcher. [CMA] start 12/2024 (Russia and Brasil)
- Kobiljon Abdurasulov CEEC-6th Researcher. [CMA] start 12/2024 (Uzbequistan)
- M. Rasouli (2018-2024) (Iran and Portugal)

6.3 Visitors

- Marcos Petrúcio de Almeida Cavalcante, Universidade Federal de Alagoas (Brasil) (17 a 26 de fevereiro de 2025.)
- Yang Chen, Professor Emérito da Universidade de Macau (China) (06 a 11 de abril de 2025)
- Fernando Manfio, Universidade de São Paulo (Brasil) (17 a 21 de novembro de 2025)
- Abror Khudoyberdiyev (Romanovskiy Institute of Mathematics, Uzbekistan, 2 weeks);
- Bauyrzhan Sartayev (Narxoz University, Kazakhstan, 1 week).
- Tiago Macedo (Federal University of São Paulo, Brazil, 1 week).

7 Publications

7.1 Book chapter

[1] Pinheira, V., Moreira, M.J.G., Patto, M.V., Afonso, R.M., Pereira, L., Roque, N. (2025). More Age, Greatest Disability? Comparative Analysis of the Results of the 2011 and 2021 Portuguese Census. In: Guardado Moreira, M.J., A. Carvalho, L.S., Simões, Â., Candeias, M.d.J., Tomás, H.M. (eds) Sustainability in Aging. Lecture Notes in Bioengineering. Springer, Cham. https://doi.org/10.1007/978-3-031-77282-5-22

7.2 Publications in International Journals

Mathematics and Theoretical Physics

[1] Abdelwahab, Hani; Abdurasulov, Kobiljon; Kaygorodov, Ivan. The Algebraic and Geometric Classification of Noncommutative Jordan Algebras". Frontiers of Mathematics (2025)
URL `https://doi.org/10.1007/s11464-024-0173-7`
Q_3 (SJR 2024)

[2] Abdurasulov, Kobiljon; Lubkov, Roman; Azamat Saydaliyev. The Algebraic and Geometric Classification of Jordan Superalgebras. Siberian Electronic Mathematical Reports 22 1 (2025): 813-852.
URL `https://doi.org/10.33048/semi.2025.22.052`
Q_3 (SJR 2024)

[3] Hani Abdelwahab, Ivan Kaygorodov, Bauyrzhan Sartayev. Shift associative algebras. Rendiconti del Circolo Matematico di Palermo (2), 74 (2025), no. 5, Paper No. 145.
URL `https://link.springer.com/article/10.1007/s12215-025-01261-1`
Q_2 (SJR 2024)

[4] Hani Abdelwahab, Ivan Kaygorodov, Roman Lubkov. The algebraic and geometric classification of δ-Novikov algebras. Boletin de la Sociedad Matematica Mexicana (3) 31 (2025), no. 3, Paper No. 145.

URL https://link.springer.com/article/10.1007/s40590-025-00827-4
Q_2 (SJR 2024)

[5] Hani Abdelwahab, Amir Fernández Ouaridi, Ivan Kaygorodov. Degenerations of Poisson-type algebras. Rendiconti del Circolo Matematico di Palermo (2), 74 (2025), no. 1, Paper No. 63.
URL https://link.springer.com/article/10.1007/s12215-024-01152-x
Q_2 (SJR 2024)

[6] Abdurasulov, Kobiljon; Abror Khudoyberdiyev; Feruza Toshtemirova. The geometric classification of nilpotent Lie–Yamaguti, Bol and compatible Lie algebras. Communications in Mathematics (2025). DOI:
URL https://doi.org/10.46298/cm.15810
Q_2 (SJR 2024)

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Mathematics and Theoretical Physics

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8 Communications

8.1 Communications in international scientific meetings

[1] Isaac Akoto, Célia Nunes, Carla Santos and João T. Mexia (2025). Exploring Asymptotic Normality in Multinomial Models. 25th International Conference on Computational and Mathematical Methods in Science and Engineering (CMMSE), Costa Ballena, Cádiz, Spain, July 2-8

[2] Antunes, P., Ferreira, S. S., Ferreira, D. (2025). Advanced estimation of higher-order cumulants in bi-additive statistical models for applied sciences, Session "Computing and Artificial Intelligence", 6th International Electronic Conference on Applied Sciences (ASEC 2025).

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[14] Rebocho, M.N. (2025). A sequence of orthogonal polynomials governed by a Painlevé equation PVI, Formal and Analytic Solutions of diff. Equations - FASdiff25, 1-5 de setembro, Alcalá de Henares, Espanha.

[15] Rocha, A., Correia, P., Amaral, M., Ferreira, D., Grancho, M. (2025). Psychomotor Assessment in Autism Spectrum Disorder, 15th International Conference on Statistics, Mathematics and Computation (WSMC15), Santarém, Portugal, November 7–8.

[16] Carla Santos, Célia Nunes, Cristina Dias and João T. Mexia (2025). Combining Mixed Models with Shared Algebraic Structure. International Conference on RA (Risk Analysis), ICRA10,Patras, Greece, September 22-24

[17] Silva, I., Azevedo, A., Correia, P., Ferreira, D. (2025). Adverse Childhood Experiences and the Development of Psychopathology: A Statistical Approach in Medical Research, 15th International Conference on Statistics, Mathematics and Computation (WSMC15), Santarém, Portugal, November 7–8.

8.2 Communications in National Meetings

[1] Antunes, P., Ferreira, S. S., Ferreira, D. (2025). GRIP e PCEYE no ensino da matemática a aluno com paralisia cerebral no 5.º ano do 2.º ciclo do ensino básico em Portugal, XI Ciclo de Conferências da Faculdade de Ciências, Universidade da Beira Interior, Covilhã, 3-4 de outubro.

[2] Kwaku Opoku-Ameyaw, Célia Nunes, Manuel L. Esquível (2025). Rank and Related Tests: A Randomization Procedure for Grouping Factor Levels in Cocoa Breeding Experiments. XXVII Congresso da Sociedade Portuguesa de Estatística (SPE25), Universidade do Algarve, Faro, 22-25 de outubro.

9 Organized conferences and seminars

9.1 Hosted International Conferences and Scientific Meetings

[1] Workshop XIX Non-Associative Day in Covilha, Universidade da Beira Interior, 05/12/2025 (Membros da comissão organizadora: I. Kaygorodov, I. Cunha, K. Abdurasulov e P. Beites)
URL `https://sites.google.com/view/nonassociativedaycovilha2025/home`

9.2 Participation of members of CMA in the organization of international conferences, invited seminar series and scientific meetings

[1] 8th International Conference on Mathematics and Statistics (ICoMS 2025), Athens, Greece. (Program Co-Chairs: D. Ferreira e S. Ferreira)
URL https://www.icoms.org/com.html

[2] XV Workshop on Statistics, Mathematics and Computation (WSMC15), ISLA, Santarém, November, 7– 8, 2025. - (Membros da Comissão Científica: D. Ferreira e S. Ferreira)
URL https://sites.google.com/view/wsmc15/committees?authuser=0

[3] 10th International Conference on Data Mining and Knowledge Management (DaKM 2025), September 27 - 28, 2025, Toronto, Canada. - (Membro da Comissão Científica/Reviewer: D. Ferreira)
URL https://ccsit2025.org/dakm/index

[4] 11th International Conference on Fuzzy Systems and Data Mining, November 14-17, 2025, Chaozhou, Guangdong, China. - (Membro do Technical Program Committee: D. Ferreira)
URL http://2025.fsdmconf.org/TPC

[5] Workshop New Trends in Quaternions and Octonions, 12-13/9/2025, Universidade de Aveiro, (Comissão Organizadora e Comissão Científica: P. D. Beites)

[6] CIMPA-2025: Modern trends in non-associative algebras [Uzbekistan] (Membro das comissões científicas e organizadoras: I. Kaygorodov)
URL https://sites.google.com/view/cimpa2025uzbekistan/home

[7] X International Workshop "Non-associative algebras in Dijon´25" (Membro das comissões científicas e organizadoras: I. Kaygorodov)
URL https://sites.google.com/view/nonassociativedijon2025/home

[8] IX International Workshop "Non-associative algebras in Lisbon´25" (Membro das comissões científicas e organizadoras: I. Kaygorodov)
URL https://sites.google.com/view/nonassociativelisbon2025/home

[9] XX Non-Associative Day in Online´25 (Membro das comissões científicas e organizadoras: I. Kaygorodov)
URL https://sites.google.com/view/nonassociativeonline2025/home

[10] XVIII Non-Associative Day in Tashkent´25 (Membro das comissões científicas e organizadoras: I. Kaygorodov)
URL https://sites.google.com/view/nonassociativetashkent2025/home

[11] XVII Non-Associative Day in Madrid´25 (Membro das comissões científicas e organizadoras: I. Kaygorodov)
URL https://sites.google.com/view/nonassociativedaymadrid2025/home

[12] XVI Non-Associative Day in Azores´25 (Membro das comissões científicas e organizadoras: I. Kaygorodov)
URL https://sites.google.com/view/nonassociativedayazores2025/home

[13] European Non-Associative Algebra Seminar (every Monday) (Membro da comissão científica e da comissão organizadora: I. Kaygorodov)
URL `https://sites.google.com/view/enaaw/home`

9.3 Regular seminars in CMA-UBI

[1] Aspectos variacionais das superfícies mínimas, Marcos Cavalcante, Universidade Federal de Alagoas, Brasil -20 de fevereiro de 2025

[2] Cohomogeneity one hypersurfaces in space forms, Fernando Manfio, University of São Paulo, Brasil - 21 de novembro de 2025

[3] Willian S. Panni. Equações diferenciais biharmónicas evolutivas com crescimento não standard, Seminários do Centro de Matemática e Aplicações da Universidade da Beira Interior, Portugal, 15/01/2025.

[4] History of fractals, introduction to the fractal world and how to construct them. Gökçe Çakmak (Eskisehir Technical University), 3 e 4 de abril

[5] Quenched linear response for random systems with a nonuniform decay of correlations. Davor Dragicevic, University of Rijeka, 16 de maio

[6] Statistical properties of dynamical systems via induced Weak Gibbs Markov maps, Asad Ullah, UBI e CMA-UBI, 10 de outubro

[7] Willian S. Panni. Analytical and numerical study of a parabolic differential equation with the $p(x)$-bilaplacian operator, Seminar of Analysis, Center for Mathematics and Applications (NOVA Math), NOVA SST, Universidade NOVA de Lisboa, Portugal, 23/09/2025.

10 Seminars by invitation in other universities

[1] César M. Silva. Characterization of μ-dichotomies via time rescaling and generalized Sacker-Sell spectrum, Seminário do Grupo de Análise Funcional e Aplicações do Centro de Investigação e Desenvolvimento em Matemática e Aplicações (CIDMA), Universidade de Aveiro, 20 de março de 2025.

11 Science Dissemination Activities

CMA-UBI has been organizing and supporting numerous science dissemination events. We firmly believe that promoting Mathematics and Physics is an essential endeavor. On one hand, we showcase the research conducted at CMA-UBI. On the other hand, we present scientific knowledge in an accessible format to the general public and foster scientific curiosity among an audience that includes the scholarly community.

In the coming years, CMA-UBI intends to continue organizing and supporting science dissemination activities for large audiences, particularly focusing on the Beira Interior region. With the aim of sharing scientific knowledge within the community and inspiring future scientists, CMA-UBI will organize or support exhibitions, workshops, festivals, junior science academies, and lectures both within and outside UBI. These events will

involve direct participation from CMA-UBI members and feature the presence of recognized scientists. This is intended not only to facilitate the community's interaction with national and international experts in science dissemination but also to encourage and enhance CMA-UBI's initiatives in this field.

Below we provide a list of events where CMA-UBI had an active role.

[1] Computação Quântica, Escola Secundária Quinta das Palmeiras, Covilhã, 24 de novembro (João Marto)

[2] Rogério Serôdio e Ana Paula Martins. Projeto "Simulação de Monte Carlo em Python" da Academia Júnior STEAM. 7, 14 e 21 de fevereiro de 2025

[3] Dário Ferreira - Dinamizador da sessão Bora lá ganhar gosto pela Estatística? Projeto Academia Júnior STEAM na UBI

[4] Sandra Ferreira - Dinamizador da sessão "Bora lá ganhar gosto pela Estatística?", da Projeto Academia Júnior STEAM na UBI