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Born on April 7th, 1962 at Agramunt (Spain)
Nationality: Spanish
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A.1. Present position and service commitments:

Profesora Titular de Universidad at the Departament de Matemàtiques of the Universitat Autònoma de Barcelona (UAB), Bellaterra (Barcelona) SPAIN. Since November 2015.

Member of the Editorial Board of **Journal of Algebra and its Applications** since 2019 and of **Communications in Algebra** since September 2023.

I am coordinator of the Emmy Noether Prize of: **Societat Catalana de Matemàtiques** to the best Bachelor's thesis in Mathematics in Catalonia.

A.2. Previous positions:

At Universitat Autònoma de Barcelona (UAB):

1. Catedrática de Escuela Universitaria (permanent position)	From July 1995 to November 2015
2. Titular de Escuela Universitaria (permanent position)	from December 1992 to June 1995.
3. Titular de Escuela Universitaria (interina)	from October 1989 to November 1992.
4. Teaching Assistant	October 1985 to October 1989.

In the last 5 years I was:

From January 2022 to February 2025, I was affiliated at the CRM, being also a member of the Committee **Inter Area Task Force (IATF)** *of the Centre de Recerca Matemàtica. The goal of the committee is to promote the collaboration between different research groups in the CRM as part of the actions associated to the Maria de Maeztu Award of the CRM*

President of the Societat Catalana de Matemàtiques (SCM) From February 2019 to December 2022
Member of the Board of Trustees of the Fundació Ferran Sunyer i Balaguer From Feb. 2019 to Dec. 2022.

As president of (SCM) I attended the Meeting of Presidents of the European Mathematical Society (EMS), and the General Assembly of the EMS. I also was a member of the Steering Committee of the CENTRE INTERNATIONAL DE MATHÉMATIQUES PURES ET APPLIQUÉES (CIMPA), as well as its General Assembly.

Secretary of the Comité Español de Matemáticas (CEMat) Spanish adhering Organization to the International Mathematical Union. Since May 2019 to the end of February 2024. Attended the general assembly of IMU in Helsinki in 2022.

Recent academic service

Member of the Advisor Sci. Com. of the Barcelona Graduate School of Mathematics (BGSMath) From April 2017 to September 2021
Coordinator of the PhD Program in Mathematics of the UAB September 2016-October 2019;
Member of the Governing board of the Doctoral School of the UAB May 2018-October 2019.

A.3.EDUCATION/TRAINING

1980-1985 *Bachelor of Science*, Mathematics, Universitat Autònoma de Barcelona (SPAIN).

1986-1992 *PhD in Mathematics*, Universitat Autònoma de Barcelona (SPAIN). Supervisor: Pere Menal. THESIS: On rings whose finitely generated faithful modules are generators. Link to the thesis
1993-1994 (21 months) *Post-doctoral fellowship* **Ministerio de Educación y Ciencia** (Spain) - **Fulbright Foreign Scholarship Board**. PROJECT: *Inyectividad en anillos clásicos de cocientes.* Supervised by Carl Faith. Rutgers, The State University, New Brunswick, New Jersey (USA)

B.Vita Highlights:

Member of the research group in non-commutative algebra at UAB since 1986. I have published 50 research papers. I edited two books (an Extended Abstracts volume, as well as notes for an Advanced Course at the CRM both edited by Birkhäuser).

ORCID Id 0000-0002-2350-7248 **Web of Science ResearcherID: J-8230-2014**

Scopus Author Id 6603187320 **Link to Google Scholar Profile**

I have been awarded with five *Sexenios de investigación*. The last one ended in 2025.

According to:

- **MathReviews.** I have h-index 14 and 601 citations.
- **Scopus.** I have h-index 14 and 605 citations.
- **Google Scholar.** I have h-index 19 and 1267 citations.

Main lines and achievements of my research:

1. Direct sum decompositions of modules and monoids/semigroups. As a post-doc at Rutgers University (1993 - 1994) I started to work on direct sum decompositions of modules. Jointly with A. Facchini, L. Levy and P. Vamos (1996), we gave examples proving that Artinian modules do not satisfy Krull-Schmidt theorem, answering in the negative a question posed by Krull in 1934. Along the years we formalized a theory of decompositions of modules with a semilocal endomorphism ring which is described in terms of the structure of a suitable family of monoids associated to them. From that, I moved to the case of infinite direct sums of modules and of monoids associated to them. We settled the basis to work in this direction in the papers published jointly with P. Příhoda in J. Reine und Angew. Math. (2010) and Transactions of the AMS (2014). Now we are working in different applications of the theory and we just finished codirecting a PhD Thesis with P. Příhoda. Part of the work in this line of research is reproduced in the book:

- A Facchini, Semilocal Categories and Modules with Semilocal Endomorphism Rings. Progress in Mathematics **331**, Birkhäuser 2019.

The sentences advertising the book claim: *In the twenty years following the publication of the Camps-Dicks theorem, the work of Facchini, Herbera, Shamsuddin, Puninski, Příhoda and others has established the study of serial modules and modules with semilocal endomorphism rings as one of the promising directions for module-theoretic research.*

2. Homological algebra. In my stay as a visiting professor at the Università di Padova (2004-2005), I consolidated a line of work in Homological Algebra. Solving affirmatively, together with L. Angeleri-Hügel and S. Bazzoni, the so called *Baer Splitting Problem* posed by I. Kaplansky in 1962 and whose solution was published in Transactions AMS in 2008. The quest for a better understanding of the techniques used to solve this problem led to the development of the so-called *Mittag-Leffler conditions*. Our ideas to introduce these conditions were initially based in an influential paper by Raynaud and Gruson (Inv. Math., 1971), which was taken into light also in works by Drinfield in 2006.

In my research, an important work in this direction is a joint paper with J. Trlifaj (Charles Univ., Prague) published in Advances in Math. in 2012. These results were included in the book by R. Göbel and J. Trlifaj (*Approximations and Endomorphism Algebras of Modules*. Expositions in Mathematics **41**. De Gruyter, 2012). The Mittag-Leffler conditions have had a real impact in the theory of cotorsion pairs, and have become an important tool that keeps evolving.

With my PhD student Simone Virili (PhD 2014), we started an exploration of more categorical methods, taking advantage of new ideas coming from Geometry and Topology. Recently, I have been collaborating in this line of research also with Saorín (Universidad de Murcia) and Pitsch (UAB) (and Virili).

In addition, I have an ongoing collaboration with G. Le Gross, who was a post-doc at UAB under my supervision in 2025 (financed by the LIGAT project), and with Michal Hrbek. As a fruit of this collaboration, we have already an accepted paper, and we have just concluded a preprint joint with M. Hrbek.

3. Division rings, rank functions and bimodules With my PhD student J. Sánchez (PhD 2008) I started to work on Division rings. The most significant result in this direction answered a question posed by Neumann in 1949, and it was published in Selecta Math. in 2015. The results and techniques on Javier's thesis were used and extended in the PhD thesis of Diego López Álvarez (2021), advised by Andrei Jaikin (UAM/ICMAT).

Right now I am working on the topic from the point of view of rank functions with Simone Virili and Lidia Angeleri-Hügel. A very initial part of the project has been developed with Mahsa Paykanian (a former visiting PhD student from Yasuj University, Iran).

PhD supervision and post-docs:

- **Javier Sánchez Sardà**: *Localization: On division rings and tilting modules* that was defended on July 18th 2008 at the UAB. Now Javier is an Associate Professor at the University of Sao Paulo (Brazil). The thesis was awarded with the *Mención Europea de Calidad*
- **Simone Virili**: *Group representations, algebraic dynamics and torsion theories*. It was defended on September 15th, 2014. The thesis was awarded with the *Mención Europea de Calidad*. It has the *Premi extraordinari de doctorat 2014*. Simone was given the ICRA Award in 2020. Has done a number of post-doc stays between them a Maria Zambrano at UAB.
- **Román Álvarez**,*Relatively Big Projectives, Direct sum decompositions of modules, and Representations of Finite Groups*. The thesis is co-supervised with Prof. Pavel Příhoda, and it is done via a cotutelle agreement with Charles University (Prague). The defence is scheduled for February 9th, 2026. Román was awarded with a four-year pre-doctoral grant FI financed by the Generalitat de Catalunya, and with a grant for short research stay at University of Ljubljana (Slovenia) from the Fundació Ferran Sunyer i Balaguer to work with Prof. Daniel Smertnig. Román just got a one-year post-doctoral grant at University of Ljubljana to continue this collaboration.

In the recent years, I was responsible of the post-doc stay of Giovanna Le Gross (first period of almost one year starting in February 2020, and a second one of 6 months starting on October 2023). I was also responsible of the visiting PhD student Mahsa Paykanian (Yasuf University, Iran) visiting for six months with a grant of the Iranian government (November 2022 to January 2023).

Research events organization. I have organized around 20 international scientific events during my career. Last one has been CSASC 2026, Pilsen, 2-6 February 2026. I was member of the Program Committee, and I co-organized the workshop *Representation Theory and Commutative and non-Commutative Algebra* together with Jan Stovicek (Charles University, Prague) and Daniel Smertnig (University of Ljubljana, Slovenia).

The most recent activities I co-organized are :

- a satellite of the 9th European Congress in Mathematics. The activity was made at the Centre de Recerca Matemàtica and consisted of:
  - the course: GEOMETRY, ALGEBRA AND TOPOLOGY IN MACHINE LEARNING, ARTIFICIAL INTELLIGENCE AND BIG DATA (GATMAID), 25-29 June, 2024. The School got also 6000 euros of financial support from the European Mathematical Society.
  - the conference Joint Perspectives in Geometry, Algebra and Topology, 1-5 July 2024.
- Member of the scientific committee of the conference: *Czech, Slovenian, Austrian, Slovak and Catalan Mathematical Societies joint meeting* CSASC 2018, 11 - 14. September 2018. Bratislava. I also organized a special session in that conference.

- Co-organizer of the conference: *Czech, Slovenian, Austrian, Slovak and Catalan Mathematical Societies joint meeting* CSASC 2016, Barcelona. September 20–23, 2016. I was also organizing the special session: *Applications of categories in Algebra and Topology.*
- Co-organizer of the special session: *Associative rings and algebras* at the First Joint Meeting Brazil-Spain of Mathematics (Fortaleza, Brazil). December 2015.
- Follow up of the research program IRTATCA at CRM. This consisted of an advanced course (June 3rd to 7th, 2019) and a Conference (June 11th to 15th, 2019)
- Co-organizer of the Research Program *Interactions between Representation Theory, Algebraic Topology and Commutative Algebra (IRTATCA)* Jan.–July 2015 (CRM).

Recent service activities and popularization of mathematics. Being Coordinator of the PhD Program in Mathematics at UAB (2016-2019), the four years of presidency of the Societat Catalana de Matemàtiques (2019-2022), as well as being the secretary of CEMat represented a turning point in my professional activity. This was a very intensive period in which I learned a lot about the popularization of mathematics (in which the SCM has activities with very high impact, as the Prova Cangur with more than 100.000 participants from schools all over Catalonia), general situation of mathematics at all levels (from primary to secondary school, to the advanced research level and the big expansion of mathematicians' jobs in industry) in Catalonia and in Spain. I think this has complemented in an excellent way my perspective of a career of almost 40 years as university professor and as researcher in Algebra.

As president of the SCM I was PI of the projects financed by the Spanish Foundation for Science and Technology (Fecyt): FCT 21-16863 (9.000 euros, 2021), FCT 19-14408 (9.000 euros, 2019), FCT 18-13617 (6.000 euros, 2018). All inside the program: Ayudas para el fomento de la cultura científica y de la Innovación, and intended to support the program *Estímulo del Talento Matemático* (EsTalMat) addressed to children from 12 to 14 years old that are especially talented for mathematics.

In the recent years, I have also collaborated as evaluator of projects for several research agencies. In 2023, 2024 and 2025 I participated in the final evaluation panel of **Post-doctoral Grants Beatriu de Pinos** for AGAUR (Generalitat de Catalunya, Spain) being also member of the final committee assigning the grants. In 2023 I also participated in the final evaluation interviews for **PhD Grants INPhINIT for La Caixa Foundation** (Spain), and made evaluation reports for positions for the **Czech Academy of Sciences** and for **Yamouk University** (Jordan).

I have been evaluator of projects for: **COLCIENCIAS** (Colombia); **Agencia Nacional de Evaluación y Prospectiva** (Spain); **FONDECYT** (CHILE); **AGAUR** (Generalitat de Catalunya) and **Turkish Academy of Sciences**.

I was external evaluator of PhD Thesis at: Università di Padova (Italy) 2019, Charles University (Prague, Czech Republic) 2024, University of Shillong (Shillong, India) 2024.

Presently, I am member of the societies: SCM, RSME, EMS, EWM and AMS.

Part C.RECENT RESEARCH RESULTS

C.1. Recent publications

- Dolors Herbera, Wolfgang Pitsch, Manuel Saorín, Simone Virili, *A poisonous example to explicit resolutions of unbounded complexes.* Publ. Mat. **70** (2026), 445-492. DOI: 10.5565/PUBLMAT7022607. Available also at arXiv:2407.09741.
- Román Álvarez, Dolors Herbera, Pavel Příhoda, *Relatively big projective modules and their applications to direct sum decompositions* (2025). Journal of Algebra and its Applications, special issue in honor of Tariq Rizvi https://doi.org/10.1142/S0219498825420186. Full text available at arXiv:2504.16568
- Román Álvarez, Dolors Herbera, Pavel Příhoda, *Torsion-free Modules over Commutative Domains of Krull Dimension One.* (2025). Rev. Mat. Iberoamericana. https://doi.org/10.4171/rmi/1564
  Full text available at arXiv:2406.14665

- Dolors Herbera, Pavel Příhoda and Roger Wiegand *Big pure projective modules over commutative noetherian rings: Comparison with the completion.* Forum Mathematicum **37** (2025), 1103–1146. https://doi.org/10.1515/forum-2024-0031
- D. Herbera and R. Fernández-Alonso; *Finite Lattices of Preradicals over Finite Representation Type Rings.* Int. Electron. J. Algebra **21** (2017), 103–120. Open publication
- P. Aydogdu and D. Herbera; *A family of examples of generalized perfect rings.* Comm. in Algebra **44** (2016) 1171–1180. Full text available at arXiv:2512.19813
- D. Herbera and J. Sánchez; *The inversion height of the free field is infinite.* Selecta Math. **21** (2015) 883–924. Full text available at arXiv:1303.5287
- D. Herbera and P. Příhoda; *Infinitely generated projective modules over pullbacks of rings.* Trans. Amer. Math. Soc. **366** (2014), no. 3, 1433–1454. Full text available at arXiv:1105.3627

Preprints submitted for publication:

- Dolors Herbera, Michal Hrbek and Giovanna Le Gros, *Semi-Bousfield classes and nonmonotone perversities* (2026). 43 pp. arXiv:2605.30262
- D. Herbera and P. Příhoda;, *Trace ideals and uniserial modules* (2026). 27 pp. arXiv:2605.12459
- Dolors Herbera, Michal Hrbek and Giovanna Le Gros, *Cotorsion pairs and Tor-pairs over commutative noetherian rings* (2024). 27 pp. arXiv:2411.04514

C.2. Recent Conference Participation

I usually participate in, at least, one or two conferences every year. Most recent conferences/events participations are:

- Okinawa Institute of Science and Technology (Japan). Invited thematic Program Participant: TDA Parti. From 2025-07-20 to 2025-08-09. I delivered the invited talk *Parametrizing large projective modules.*
- Conference on Rings and Polynomials. July 14 - 19, 2025 TU Graz, Graz, Austria. Invited plenary speaker with the talk *The monoid of relatively big projective modules.*
- NonCommutative Rings and their Applications, IX (NCRA, IX) 30 June-04 July 2025. Lens (France). Invited main Speaker, with the talk *Monoids of relatively big projectives and applications to direct sum decomposition of modules.*
- Special session *50 years of Communication in Algebra.* Joint Meeting of the NZMS, AustMS and AMS. Invited participation with the talk *A monoid of infinitely generated projective modules and its applications to direct sum decompositions of modules* . Conference held at Auckland, New Zealand, from 9th – 13th December 2024.
- *Representation Theory and Topological Data Analysis.* Invited participation, with the talk: *An approach to relative homological algebra for persistence modules.* Workshop at the Banff International Research Station for Mathematical Innovation and Discovery (BIRS). Banff, Alberta, Canada. April 7 - April 12, 2024
- *Groups, Rings and Group Rings 2024.* Invited participation as plenary speaker and member of the scientific committee, right now editor of a Special volume of São Paulo Journal of Mathematical Sciences dedicated to the conference. Talk: *Cotorsion pairs generated by pure-injective modules over commutative noetherian rings.* Ubatuba, Brasil, July 8 to 13, 2024

I have been giving talks with variants of the title: *Torsion Free modules over commutative domains of Krull dimension 1*, at the conferences:

- *XXVII Brazilian Algebra Meeting* Plenary Speaker IME-USP, Sao Paulo, Brasil, July 15th to July 19th, 2024.

- *Trends in Representation Theory and Related Topics* Invited plenary speaker, Universitatea Babeș-Bolyai, Cluj-Napoca (Romania) September 12-16, 2023.
- Functor Categories, Model Theory, and Constructive Category Theory Universidad de Málaga, Málaga, 3-7 July, 2023
- *Homological Commutative Algebra and Related Topics.* Invited participation. June 14, 2022 - June 16, 2022 Georgia Southern University, Savannah, USA.
- *International Conference on Noncommutative Algebra and its Applications.* Invited participation. May 9-12 2022. Tarbiat Modares University (Iran). On-line conference
- *EWM GENERAL MEETING 2022*, Invited communication at the mini-symposium: Trends in Ring Theory and related topics- AUGUST 22-26, 2022 Aalto University, Espoo (Finland)
- *Silting Theory, Algebras and Representations.* Invited participation Charles University, Prague, 12 – 16 September, 2022

I was also one of the teachers of the CIMPA School (CENTRE INTERNATIONAL DE MATHÉMATIQUES PURES ET APPLIQUÉES): *Algebra Winter School: Rings, Algebras, and Category Towards Coding and Computer Algebras.* Helwan University, Cairo, Egypt. CIMPA / ICPAM School, 10 - 21 December 2022. I was giving a six-hour course on *Quasi-Frobenius Rings.*

C.3. Recent Research Projects

PI of the project:

- *Laboratori d'Interaccions entre Geometria, Àlgebra i Topologia* LIGAT 2021 SGR 01015 (2022–2025). Total Amount 60.000 euros. Funded by AGAUR Agència de Gestió d'Ajuts Universitaris i de Recerca (Generalitat de Catalunya, Spain)

Researcher in the projects:

- *CLASIFICACION, ESTRUCTURA Y PROPIEDADES DE REGULARIDAD DE ANILLOS, MODULOS, C*-ALGEBRAS Y DINAMICA* PID2023-147110NB-I00 (100.000 eu), Project leaders: Pere Ara Bertrán and F. Perera. (2024-2027)
- *ANILLOS, MÓDULOS, C*-ÁLGEBRAS, Y DINÁMICA: CLASIFICACIÓN, ESTRUCTURA FINA Y REGULARIDAD*; MINECO PID2020-113047GB-I00 (2021-2024). Project leaders: Pere Ara Bertrán and Francesc Perera.
- *ESTRUCTURA Y CLASIFICACION DE ANILLOS, MODULOS Y C*-ALGEBRAS: INTERACCIONES CON DINAMICA, COMBINATORIA Y TOPOLOGIA*; MINECO MTM2017-83487-P (2018-2020). Project leader: Pere Ara Bertrán.
- *Laboratori d'Interaccions entre Geometria, Àlgebra i Topologia* LIGAT 2017-SGR-1725 (2017–2019). Project leader: Carles Broto.

While affiliated with the CRM I was also supported by the project Severo Ochoa and Maria de Maeztu Program for Centers and Units of Excellence in R D (CEX2020-001084-M).

International Participant in the project:

- *Modules, Monoids, and Factorizations.* The project has Alfred Geroldinger (University of Graz) as PI. **FWF Austrian Science Fund. Grant DOI 10.55776/P36742** Funding program *Principal Investigator Projects.* Project no. P 36742. Amount: 406.240 euros. From June 1, 2023 to end of May 31, 2027. Link to the project