José A. Vallejo

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Areas of specialization

Differential Geometry; Theoretical Physics; Computer Algebra Systems

Appointments held

2006-present	Full Professor, UASLP, México
2019-2020	Sabbatical leave, Technical University of Cartagena, Spain
2012-2013	Sabbatical leave, University of Sonora, México
2004-2006	Lecturer, Technical University of Catalonia, Spain
2003-2004	Visiting scholar, UASLP, México

Education

2003	PhD in Mathematics, University of Valencia, Spain
2001	MSc in Mathematics, University of Valencia, Spain
1998	BSc in Mathematics, University of Valencia, Spain
1998	BSc in Physics, University of Valencia, Spain
	Several research stays in the Spanish National Research Council (CSIC, Spain), the Center for Research in Mathematics (CIMAT, México), the Technical University of Cartagena (Spain), the Tōhō University (Japan), and the National Institute of Technology (Japan)

Grants, honors & awards

2012-2016	CONACyT grant code CB-2012-179115 (one-year extension valid through 2017), México
2016	Plenary talk at the *XLIX Congress of the Mexican Mathematical Society*, Aguascalientes,
2008-2011	México CONACyT grant code CB-J2-78791, México
2007-2022	ProDEP profile, awarded by the Mexican Secretary of Public Education
2007-present	Member of the National Researcher System (SNI), México. Currently Level 2

Publications & talks

More than 30 scientific publications in international refereed (and indexed) journals. A complete list is available at ORCID https://orcid.org/0000-0002-9508-1549. Also in Scopus https://www.scopus.com/authid/detail.uri?authorId=7102884719. A starred item means a joint publication with a student

RECENT PUBLICATIONS (LAST FIVE YEARS)

2021*   M. Avendaño Camacho, A. Torres Manotas and J. A. Vallejo, 'Closed stable orbits in a strongly coupled resonant Wilberforce pendulum', to appear in *Journal of Vibration and Control*

2020   J. A. Vallejo, 'A radical approach to the role of computational thinking in teaching Mathematics', *J. Phys.: Conf. Ser.* **1581** (2020) 012071

2020   S. Takato and J. A. Vallejo, 'Using Oshima splines to produce accurate numerical results and high quality graphical output', *Mathematics in Computer Science* **14** 1 (2020) 399-413

2019   S. Takato and J. A. Vallejo, 'Hamiltonian dynamical systems: symbolical, numerical and graphical study', *Mathematics in Computer Science* **13** 1-2 (2019) 281-295

2019*   M. L. Mendoza-Martínez, J. A. Vallejo and W. A. Zúñiga-Galindo, 'Acausal quantum theory for non-Archimedean scalar fields', *Reviews in Mathematical Physics* **31** 4 (2019) 1950011

2019   G. Dávila, A. Morante and J. A. Vallejo, 'Synchronization of dynamical systems: an approach using a Computer Algebra System', *Electronic Journal of Mathematics and Technology* **13** 1 (2019) 1-24

2018*   O. Morales, F. Periago and J. A. Vallejo, 'Robust Optimal Design of Quantum Electronic Devices', *Mathematical Problems in Engineering* (2018) Article ID 3095257

2018*   R. Ipiña and J. A. Vallejo, 'Number theory and cryptography in your smartphone', *Electronic Journal of Mathematics and Technology* **12** 1 (2018) 230–246

2018*   A. Molgado, O. Morales and J. A. Vallejo, 'Virtual beams and the Klein paradox for the Klein-Gordon equation', *Revista Mexicana de Física* **E64** 1 (2018) 1–6

2017   M. Avendaño-Camacho, J. A. Vallejo and Yu. Vorobiev, 'A perturbation theory approach to the stability of the Pais-Uhlenbeck oscillator', *Journal of Mathematical Physics*, **58** (2017) 093501

2017   S. Takato, A. McAndrew, M. Kaneko and J. A. Vallejo, 'Collaborative use of KeTCindy and free Computer Algebra Systems', *Mathematics in Computer Science*, **11** 3–4, 503-514

2017   J. A. Vallejo and Yu. Vorobiev, 'G–invariant deformations of almost-coupling Poisson structures', *Symmetry, Integrability, and Geometry: Methods and Applications*, **13** 022

RECENT INVITED TALKS AND COURSES (LAST FIVE YEARS)

2019   'Computer, Software, Mathematics, Teaching', *III International Seminar on Innovation in Mathematics and Mathematics Education (ISIMMED)*, Yogyakarta State University, Yogyakarta, Indonesia.

2019   'Uso de CAS en investigación y docencia', *Simposio de Matemáticas Aplicadas a las Tecnologías de la Información*. Universidad Juárez Autónoma de Tabasco, México.

2018   'Correcting errors: putting elementary topology to work', *XXIII Asian Technology Conference in Mathematics*, Yogyakarta State University, Yogyakarta, Indonesia.

2018	'Introducción a la geometría de la supersimetría', UNemat 2018, Universidad Nacional de Colombia, Bogotá, Colombia.
2018	'Introduction to Quantum Field Theory', course given in the *First Summer School on Arithmetics, p–adic Analysis and Mathematical Physics*. Pontificia Universidad Javeriana, Bogotá, Colombia
2018	'Symplectic curvature on supermanifolds', *Encuentro de sociedades matemáticas de Colombia y México, Special session on Poisson Geometry and generalizations*, Barranquilla, Colombia
2017	'Stability of theories with higher-order derivatives', *I Joint Congress RSME-UMA*. Universidad de Buenos Aires, Buenos Aires, Argentina
2017	'Dynamical Systems in Enginnering with Maxima', *Seminar on Mathematical Software and its use in Education*, National Institute of Technology, Nagano College, Japan
2017	'KETCindy and Maxima applied to partial differential equations and Computer–Aided Geometric Design', *Seminar of the Department of Mathematics*, Faculty of Pharmaceutical Sciences, Toho University, Japan
2017	'Stability of the Pais-Uhlenbeck oscillator via perturbation theory'. *CEDyA 2017* Special Session on Mathematical Physics, Cartagena, Spain

Teaching & Advising

More than 15 years of teaching experience at the university level. Taught more than 30 different topics (some of them several times), both in undergraduate and graduate courses. Advised 10 BSc thesis, 5 MSc thesis, and 3 PhD thesis, resulting in 8 joint papers with students

COURSES IN THE LAST FIVE YEARS

2020–21	*Cálculo diferencial en una variable,*
	Ampliación de cálculo diferencial en una variable,
	Introducción a la Informática,
	Cálculo integral en una variable,
	Ampliación de cálculo II
2018–19	*Geometría del diseño asistido por computadora,*
	Cálculo diferencial en varias variables,
	Programación Numérica,
	Métodos Numéricos Avanzados,
	Geometría Diferencial Clásica
2017–18	*Análisis Funcional,*
	Geometría del diseño asistido por computadora,
	Geometry of Perturbation Theory for Hamiltonian Systems (Posgrado en Matemáticas Aplicadas y Física Matemática),
	Ecuaciones Diferenciales Ordinarias,
	Geometría Diferencial Clásica,
	Geometría Simpléctica (Posgrado en Matemáticas Aplicadas y Física Matemática)

2016–17	*Cálculo diferencial en una variable,* *Ampliación de cálculo diferencial en una variable,* *Fundamentos de Matemáticas,* *Física Computacional (Posgrado en Matemáticas Aplicadas y Física Matemática),* *Cálculo integral en varias variables,* *Métodos del análisis funcional en mecánica cuántica (Posgrado en Matemáticas Aplicadas y Física Matemática)*

GRADUATE THESIS

2019	Ph. D. Thesis (co-advisor: Yu. Vorobiev): Rosalía Hernández Amador, *Symplectic scalar curvature on supermanifolds.* Department of Mathematics, University of Sonora (México)
2019	M. Sc. Thesis: Alejandra Torres Manotas (co-advisor: M. Avendaño), *A study of the Wilberforce pendulum from the point of view of Hamiltonian perturbation theory.* Faculty of Sciences UASLP (México)
2019	Ph. D. Thesis (co-advisor: W. Zúñiga-Galindo): María Luisa Matínez Mendoza, *Quantum Field Theory of Scalar Fields on $p-$adic Spacetimes.* Department of Mathematics, Center for Advanced Studies of the National Technical Institute (México)
2017	M. Sc. Thesis (co-advisor: F. Periago): Ociel Armando Morales García, *Optimal design of quantum potential profiles.* Faculty of Sciences UASLP (México)
2015	Ph. D. Thesis (co-advisor: Yu. Vorobiev): Dennise García Beltrán, *Frölicher-Nijenhuis calculus in the theory of Lie algebroids.* Department of Mathematics, University of Sonora (México)
2012	M. Sc. Thesis: Valdemar Arce Guevara, *Topotitlan: A software for the visualization of metrics on $\mathbb{R}^2$.* Faculty of Sciences UASLP (México)
2011	M. Sc. Thesis (co-advisor: Yu. Vorobjev): Dennise García Beltrán, *Lie algebroids of Poisson type.* Faculty of Sciences UASLP (México)
2009	M. Sc. Thesis: Sergio Tirado Torres, *Mechanics on Lie algebroids and supermanifolds.* Faculty of Sciences UASLP (México)

Service

- Referee for several indexed scientific journals, including: Nonlinearity, Journal of Mathematical Physics, Classical and Quantum Gravity, Journal of Physics A (Mathematical and Theoretical), etc. A complete profile can be found at the Publons page:
  https://publons.com/author/1390549/jose-antonio-vallejo#profile

- Member of the Area 1 (Physics, Mathematics and Earth Sciencies) Technical Revisions Committee of the Mexican National Research System (SNI), National Council of Science and Technology.

- Referee for the Mexican National Council of Science and Technology (Basic Science Projects, Frontier Research Projects), and for the Mexican Secretary of Public Education (ProFOCIE and ProDEP programs)

- External referee for the Czech Science Foundation (Czech Republic)

- External Assessor for Promotions, Victoria University (Australia)

- Editor for the Electronic Journal of Mathematics and Techonology:
  https://php.radford.edu/~ejmt/

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