



**Prof. Dr. Tomás Recio**

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**Résumé: Tomás Recio**

Full CV at [www.recio.tk](http://www.recio.tk)

- Born in Oviedo, Spain, December 14, 1949.
- B. Sc., M.Sc. (1972), Ph. D. (1976). Universidad Complutense de Madrid.
- Full Professor of Algebra at the Universidad de Cantabria (Santander, Spain), since 1982 to September 2020 (retired). Full professor (*Catedrático de Universidad*) since Oct. 13, 1981, initial position at Universidad de Granada.
- Profesor Magistral, Universidad Nebrija, Madrid, Spain, since October 2020.

*Awards:* Placa de Honor de la Asociación Española de Científicos (2004), Encomienda de la Orden de Alfonso X El Sabio (2008), Medalla de Plata de la Universidad de Cantabria (2020), Medalla de la Real Sociedad Matemática Española (2021).

Previous positions (with tenure) at the C.S.I.C. (Consejo Superior de Investigaciones Científicas, Higher Council for Scientific Research, Madrid), Universidad Complutense de Madrid, Universidad de Málaga, Universidad de Granada.

Large number of research visits, of diverse length, at many different North American or European universities and research centers, often with participation at the different Seminars and Colloquia.

- Teaching experience in a variety of Algebra, Geometry and Mathematics Education undergraduate and graduate courses, such as the Secondary Education Math Teacher Initial Training Master degree of the University of Cantabria.

- Ph. D. advisor of over a dozen students. Former students have held or hold now university positions (mostly chairs, but also as Rectors of different universities) in Algebra, Computer Science, Geometry or Mathematics Education. See <https://genealogy.math.ndsu.nodak.edu/id.php?id=37084>

- Remarkable experience as referee for
  - Ph. D. thesis,
  - University positions,
  - Research centers and universities (evaluation of quality)
  - Research projects
  - Research papers

involving many different regional or national agencies in many countries.

- Seis sexenios

- Author of over two hundred published scientific papers and four hundred fifty scientific communications in different international journals and conferences. Topics: Real Algebraic Geometry, CAD, Robotics, Computer Algebra and Geometry, Automatic Reasoning in Dynamic Geometry, Mathematics Education, Open Science. See <http://personales.unican.es/reciot/tomas/publications.html>

- Leader of a large research group on Computational Algebraic Geometry, involving researchers from several universities, with external support since 1985, through different Spanish and European projects.

- Involved along the years, as leader or member of many research teams with public funding (European, national, CNRS...), dealing with Mathematics Education or Open Science issues.

- Large experience as responsible (General Chair, Program Chair, Local Organization, etc.) of many different International Conferences, all over the world.

- Large experience in the management of academic and educational issues, as
  - former Secretary General, Vice-Provost for Research or Director of the Institute for Educational Sciences (ICE) of the University of Cantabria
  - former President of the Education Commission of the Real Sociedad Matemática Española, Secretary and President of the national ICMI sub-commission, ie. acting as the Spanish representative to the ICM I(International Commission on Mathematics Instruction)
  - former President of the Consejo Escolar (Regional School Board) de Cantabria. He has been for about a decade, the President of the Consejo Escolar de Cantabria (Regional School Board) and a member of the Consejo Escolar del Estado Español (Spain School Board). Both institutions have the specific mission to link the education system to the community (of parents, administration and education authorities, teachers, etc).

He has developed, over the years, diverse connections to regional, national and international organizations and authorities concerning scientific issues.

• Further information available at <http://www.recio.tk/> or at <http://www.arbolmat.com/tomas-recio/>

Santander, December 2022



Tomás J. Recio

### **Refereed journal publications for the period 2017-2022**

Hohenwarter, M.; Kovács, Z.; Recio, T.: “Deciding geometric properties symbolically in GeoGebra”. R&E-SOURCE Open Online Journal for Research and Education. <https://journal.ph-noe.ac.at/index.php/resource/article/view/411> Special Issue no.6, March 2017, ISSN: 2313-1640

Botana, F.; Recio, T.: “Computing envelopes in dynamic geometry environments”. Annals of Mathematics and Artificial Intelligence, May 2017, Volume 80, Issue 1, pp 3–20. <http://link.springer.com/article/10.1007/s10472-016-9500-3>

Recio, T.; Sendra, R.; Villarino, C.: “The importance of being zero”. Association for Computing Machinery (ACM). Proceedings ISSAC 2018. ISBN 978-1-4503-5550-6/18/07. pp. 327-333, <https://doi.org/10.1145/3208976.3208981>

Kovács, Z.; Recio, T.; Vélez, M. P.: “Using Automated Reasoning Tools in GeoGebra in the Teaching and Learning of Proving in Geometry”. International Journal of Technology in Mathematics Education. Vol. 25, no. 2. pp. 33-50. 2018.

Botana F.; Kovács Z.; Recio T.: “Towards an Automated Geometer.” In: Fleuriot J., Wang D., Calmet J. (eds): Artificial Intelligence and Symbolic Computation (AISC) 2018. Lecture Notes in Computer Science, vol 11110. Springer, Cham. pp 215-220. [https://doi.org/10.1007/978-3-319-99957-9\\_15](https://doi.org/10.1007/978-3-319-99957-9_15) (2018).

Hauer, B.; Kovács Z.; Recio T.; Vélez, M.P.: “Automated reasoning in elementary geometry: towards inquiry learning.” Paedagogische Horizonte. 2(2), 2018. pp. 27-39.

Kovács, Z.; Sólyom-Gecse, C.; Recio, T.: “Rewriting input expressions in complex algebraic geometry provers”. *Annals of Mathematics and Artificial Intelligence*. April 2019, Volume 85, [Issue 2–4](#), pp 73–87. <https://rdcu.be/SEoU>

Botana, F.; Recio, T.: “A proposal for the automatic computation of envelopes of families of plane curves”. (2019). *Journal of Systems Science and Complexity* 32(1):150-157.

Kovács, Z.; Recio, T.; Vélez, M. P.: “Detecting truth, just on parts”. *Revista Matemática Complutense*, Volume 32, Issue 2, May 2019, pp. 451-474. DOI: 10.1007/s13163-018-0286-1 <https://rdcu.be/9vgh>

Davenport, J.; Fleuriot, J.; Quaresma, P.; Recio, T.; Wang, D.: “Intelligent Geometry Tools”. *Electronic Proceedings Theoretical Computer Science*. Vol. 311. Dec. 2019.

Recio T.; Richard, P. R.; Vélez, M.P.: “Designing Tasks Supported by GeoGebra Automated Reasoning Tools for the Development of Mathematical Skills”, *International Journal of Technology in Mathematics Education*, 2019, Vol 26, No 2, pp. 81-89

Hohenwarter, M.; Kovács, Z.; Recio, T.: “Using GeoGebra Automated Reasoning Tools to explore geometric statements and conjectures”. In Hanna, G., de Villiers, M., Reid, D. (Eds.): *Proof Technology in Mathematics Research and Teaching*, Series: Mathematics Education in the Digital Era, Vol. 14, 2019, pp. 215-236. Springer Cham. [https://doi.org/10.1007/978-3-030-28483-1\\_10](https://doi.org/10.1007/978-3-030-28483-1_10)

Gomez-Diaz, T. and Recio T.: “On the evaluation of research software: the CDUR procedure” [version 2; peer review: 2 approved]. *F1000Research* 2019, **8**:1353 (<https://doi.org/10.12688/f1000research.19994.2>)

Botana F.; Kovács Z.; Martínez-Sevilla, A.; Recio T.: “Automatically Augmented Reality with GeoGebra “. In: *Augmented Reality in Educational Settings*, (Ed. Theodosia Prodromou), Brill | Sense. Nov. 2019, pp. 347-368. <https://doi.org/10.1163/9789004408845>

Jablonski, S.; Lázaro del Pozo, C.; Ludwig, M.; Recio, T.: “MathCityMap, paseos matemáticos a través de dispositivos móviles”. *UNO, Revista de Didáctica de las Matemáticas*. No. 87, enero 2020, pp. 47-54. <https://www.grao.com/es/producto/mathcitymap-paseos-matematicos-a-traves-de-dispositivos-moviles-un08797755>

Kovács, Z.; Recio, T. ; Vélez, M. P.: “Reasoning about linkages with dynamic geometry”. *Journal of Symbolic Computation, J. Symb. Comput.* Volume 97, March–April 2020, pp. 16-30, <https://doi.org/10.1016/j.jsc.2018.12.003>

Botana F.; Kovács Z.; Recio T.: “Automatically Augmented Reality for Outdoor Mathematics”. In: *Research on Outdoor STEM Education in the digital Age. Proceedings of the ROSETA Online Conference in June 2020*. Matthias Ludwig, Simone Jablonski, Amélia Caldeira and Ana Moura (Editors). WTM – Verlag für wissenschaftliche Texte und Medien, Münster 2020. Conference Proceedings in Mathematics Education (6), pages 71-78. <https://doi.org/10.37626/GA9783959871440.0>

Botana, F.; Kovács, Z.; Recio, T.; Vélez, M. P.: “Hacia un autómata geométrica”. *La Gaceta de la Real Sociedad Matemática Española*, Vol. 23 (2020), Núm. 2, Págs. 343–371. <http://gaceta.rsme.es/vernumero.php?id=114>

Ladra, M.; Páez-Guillán, P.; Recio, T.: “Dealing with negative conditions in automated proving: tools and challenges. The unexpected consequences of Rabinowitsch’s trick.” *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. RACSAM* 114 (4), (Oct. 2020). <https://doi.org/10.1007/s13398-020-00874-8>

Recio, T.; Van Vaerenbergh, S.; Vélez, M. P.: “Herramientas de Razonamiento Automático en GeoGebra: qué son y para qué sirven”. *Unión, Revista Iberoamericana de Educación Matemática*. Año XVI - Número 59. Agosto 2020, páginas 08-15. <https://union.fespm.es/index.php/UNION/article/view/202>

Kovács, Z.; Lichtenegger, B.; Recio, T.; Richard P. R.; Vélez, M.P.: “Exploring artwork through Delaunay triangulations”. In: Annie Savard, Rebecca Pearce (eds.), *MACAS in the Digital Era: Proceedings of the 2019 MACAS (Mathematics and its Connections to the Arts and Sciences) Symposium*, Montreal, Quebec. Sept. 2020. <https://mcgill.ca/macass2019/proceedings>

Carrillo de Albornoz y Torres, A.; Recio, T.: “De curva a curva, con GeoGebra”. *Boletín de la Sociedad Puig Adam de Profesores de Matemáticas*, vol. 110. Oct. 2020. pp. 8--26.

Kovács, Z.; Recio, T.; Richard, P.R.; Van Vaerenbergh S.; Vélez, M.P.: “Towards an Ecosystem for Computer-Supported Geometric Reasoning”. *International Journal of Mathematical Education in Science and Technology*. Nov. 2, 2020 (on-line). Vol. 53, (7), pp. 1701-1710, 2022. <https://doi.org/10.1080/0020739X.2020.1837400>

Gomez-Diaz, T. and Recio, T.: “A policy and legal Open Science framework: a proposal”. *POLIS*, No. 19, 2020, pp 5-25, <https://uet.edu.al/polis/wp-content/uploads/2022/01/polis-19.pdf>

Kovács, Z.; Recio, T.: “Alternative Solutions and Comments to the Problem Corner--October 2020 issue”. *The Electronic Journal of Mathematics and Technology (eJMT)*. [https://php.radford.edu/~ejmt/ProblemCornerDocs/eJMT\\_Alternative\\_Solutions\\_to\\_Oct2020.pdf](https://php.radford.edu/~ejmt/ProblemCornerDocs/eJMT_Alternative_Solutions_to_Oct2020.pdf)

Kovács, Z.; Recio, T.: “GeoGebra reasoning tools for humans and for automatons”. Electronic Proceedings of the 25th Asian Technology Conference in Mathematics, December 14-16, 2020. ISSN 1940-4204 (online version).

<http://atcm.mathandtech.org/EP2020/invited/21786.pdf>

Gomez-Diaz T.; Recio T.: “Open comments on the Task Force SIRS report: Scholarly Infrastructures for Research Software (EOSC Executive Board, EOSCArchitecture)”.

Research Ideas and Outcomes (RIO Journal) 7: e63872.

<https://doi.org/10.3897/rio.7.e63872> (05 Feb. 2021)

Etayo-Gordejuela, F.; de Lucas-Sanz, N.; Recio, T.; Vélez, M.P.: “Inventando teoremas con GeoGebra: un nuevo Teorema de la Altura”, Boletín de la Soc. Puig Adam, No. 111, Abril 2021, pp. 8—27.

Kovács, Z.; Recio, T.; Vélez, M. P.: “Merging Maple and GeoGebra Automated Reasoning Tools”. In: Corless R.M., Gerhard J., Kotsireas I.S. (eds.) Maple in Mathematics Education and Research. MC 2020. Communications in Computer and Information Science, vol 1414. Springer, Cham, 2021. [https://doi.org/10.1007/978-3-030-81698-8\\_17](https://doi.org/10.1007/978-3-030-81698-8_17)

Barlovits, S.; Jablonski, S.; Lázaro, C.; Ludwig, M.; Recio, T.: “Teaching from a Distance—Math Lessons during COVID-19 in Germany and Spain”. *Educ. Sci.* **2021**, *11*, 406. <https://doi.org/10.3390/educsci11080406>

Kovács, Z.; Recio, T.; Tabera, L.F.; Vélez, M.P.: “Dealing with Degeneracies in Automated Theorem Proving in Geometry”. *Mathematics* **2021**, *9*, 1964.

<https://doi.org/10.3390/math9161964>

Fortuny, J.M.; Recio, T.; Richard, P.R.; Roanes-Lozano, E.: “Análisis del discurso de los profesores en formación en un contexto de innovación pedagógica en geometría.” *Annales de Didactique et de Sciences Cognitives*, Volume 26, **2021**, p. 195 –220.

Losada-Liste, R.; Recio, T.: “Mirando a los cuadros a través de los ojos de Voronoi. (Looking at the paintings through Voronoi’s eyes)”. *Boletín de la Sociedad Puig Adam de Profesores de Matemáticas*, vol. 112. Oct. 2021, p. 32—53.

Botana F.; Kovács Z.; Recio T.: “A mechanical geometer”. *Mathematics in Computer Science*, **15**, 631–641 (2021). <https://doi.org/10.1007/s11786-020-00497-7>

Carrillo de Albornoz, A.; Recio T.: “Extending envelope computations in Computer Algebra/Dynamic Geometry environments”. *The Electronic Journal of Mathematics and Technology (eJMT)*, Vol. 15, (3), 2021.

Kovács, Z.; Recio, T.; Vélez, M.P.: “Automated reasoning tools in GeoGebra Discovery” In: ISSAC 2021 Software Presentations. *ACM Communications in Computer Algebra*, Vol. 55, No. 2, Issue 216, June 2021. pp. 39--43.

<https://doi.org/10.1145/3493492.3493495>

Recio, T.; Losada, R.; Kovács, Z.; Ueno, C.: "Discovering Geometric Inequalities: The Concourse of GeoGebra Discovery, Dynamic Coloring and Maple Tools". *Mathematics* 2021, 9(20), 2548. <https://doi.org/10.3390/math9202548>

Taranto, E.; Jablonski, S.; Recio, T.; Mercat, C.; Cunha, E.; Lázaro, C.; Ludwig, M.; Mammana, M.F.: "Professional Development in Mathematics Education - Evaluation of a MOOC on Outdoor Mathematics", *Mathematics* 2021, Volume 9, Issue 22, 2975. <https://doi.org/10.3390/math9222975>

Kovács, Z.; Recio, T.; Vélez, M.P.: "Approaching Cesàro's inequality through GeoGebra Discovery". Proceedings of the 26th Asian Technology Conference in Mathematics, W.C. Yang, D.B. Meade, M. Majewski (eds). Published by Mathematics and Technology, LLC. ISSN 1940-4204 (Online version: <http://atcm.mathandtech.org/EP2021>). Dec. 13-15, 2021. pp. 160-174.

Kovács, Z.; Recio, T.; Vélez, M.P.: "GeoGebra Discovery in context". In: Predrag Janicic and Zoltán Kovács (eds): Proceedings of the 13th International Conference on Automated Deduction in Geometry (ADG 2021), Hagenberg, Austria/virtual, September 15-17, 2021. Electronic Proceedings Theoretical Computer Science. 352, pp. 141--147 (30th December 2021). <https://cgi.cse.unsw.edu.au/~eptcs/paper.cgi?ADG2021.16>, <https://cgi.cse.unsw.edu.au/~eptcs/content.cgi?ADG2021> doi:10.4204/EPTCS.352.16

Gomez-Diaz, T. and Recio T.: "Research Software vs. Research Data I: Towards a Research Data definition in the Open Science context". *F1000Research* 2022, 11:118 (<https://doi.org/10.12688/f1000research.78195.2>)

Gomez-Diaz, T. and Recio T.: "Research Software vs. Research Data II: Protocols for Research Data dissemination and evaluation in the Open Science context". *F1000Research* 2022, 11:117 <https://doi.org/10.12688/f1000research.78459.2>

Kovács, Z.; Recio, T.; Tabera, L.F.; Vélez, M.P.: "Dealing with degeneracies in automated theorem proving in geometry: a zero-dimensional approach". Actas del XVII Congreso EACA, pp. 113-117. Castellón de la Plana, Junio 20-22, 2022.

Kovács, Z.; Recio, T.; Vélez, M.P.: "Alternative Solutions and Comments to the Problem Corner-- October 2021 issue". The Electronic Journal of Mathematics and Technology (eJMT). February 2022. [https://php.radford.edu/~ejmt/ProblemCornerDocs/eJMT\\_Alternative\\_Solutions\\_to\\_Oct\\_2021.pdf](https://php.radford.edu/~ejmt/ProblemCornerDocs/eJMT_Alternative_Solutions_to_Oct_2021.pdf).

Kovács, Z.; Recio, T.; Vélez, M. P.: "Automated reasoning tools with GeoGebra: What are they? What are they good for?" In: P. R. Richard, M. P. Vélez, S. van Vaerenbergh (eds): Mathematics Education in the Age of Artificial Intelligence: How Artificial Intelligence can serve mathematical human learning. Series: Mathematics Education in the Digital Era, Springer, 2022. pp. 23-44.

Recio, T.: "Epilogue". In: P. R. Richard, M. P. Vélez, S. van Vaerenbergh (eds): Mathematics Education in the Age of Artificial Intelligence: How Artificial Intelligence

can serve mathematical human learning. Series: Mathematics Education in the Digital Era, Springer, 2022, pp. 437-444.

Barlovits, S.; Caldeira, A.; Fesakis, G.; Jablonski, S.; Filippaki, D. K.; Lázaro, C.; Ludwig, M.; Mammana, M.F.; Moura, A.; Oehler, D-X. K.; Recio, T.; Taranto, E.; Volika, S.: “Adaptive, Synchronous and Mobile Online Education: Developing the ASYMPTOTE Learning Environment”, *Mathematics* 2022, Volume 10, issue 10, 1628. <https://doi.org/10.3390/math10101628>

Recio, T.; Losada, R.; Tabera, L.F.; Ueno, C.: “Visualizing a cubic linkage through the use of CAS and DGS”. *Mathematics* 2022 - Vol. 10(15), 2550. Special Issue on Symbolic Computation for Mathematical Visualization. 22 Jul 2022; <https://doi.org/10.3390/math10152550>

Recio, T.; Vélez, M.P.; Ueno, C.: “Niagara Falls and the Origins of Computer Algebra”. *Maple Transactions* Vol. 2, No. 1, Article 14362, July 2022. <https://doi.org/10.5206/mt.v2i1.14362>

Brown, C., Kovács, Z., Recio, T., Vajda, R., Vélez M.P.: “Is Computer Algebra Ready for Conjecturing and Proving Geometric Inequalities in the Classroom?” *Mathematics in Computer Science* 16(31). December 2022. DOI: 10.1007/s11786-022-00532-9 <https://rdu.be/c07bf>