



Josué Tonelli-Cueto

Mathematician
Postdoc at Inria Paris



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Inria Paris & IMJ-PRG



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Interests

- ★ Numerical algorithms and condition-based complexity
- ★ Computational algebraic geometry
- ★ Random geometry

Languages

Castellano (Spanish) — [Native]

English

Euskera (Basque)

Deutsch (German)

(*)[The scale follows the Common European Framework of Reference for Languages: Learning, Teaching, Assessment with the black lines indicating levels A2, B2 and C2 and the gray lines the levels A1, B1 and C1.]

Programming

C

FORTRAN

GAP

MatLab

julia

R

(*)[The skill scale for each program or programming language is from 0 (Fundamental Awareness) to 6 (Expert).]

Last update on the 9th of April of 2021.

employment & education

- 2020-22 FSMP Postdoctoral Fellow Inria Paris & IMJ-PRG
In the OURAGAN team with F. Roullier and E. Tsigaridas
- 2020 Postdoctoral researcher Inria Paris & IMJ-PRG
In the OURAGAN team with F. Roullier and E. Tsigaridas
- 2017-19 Dr. rer. nat. Mathematik (PhD in Mathematics) BMS & TU Berlin
Under the supervision of Prof. P. Bürgisser and Prof. F. Cucker.
- 2014-17 M.Sc. Mathematics BMS & TU Berlin
M.'s t. "On the complexity of some Null-Cone Membership Problems" with Prof. P. Bürgisser.
- 2009-14 Licenciatura en Matemáticas con Premio Nacional Fin de Carrera UPV/EHU
B. Mathematics in the University of the Basque Country.

grants & awards

- 2020 3rd Prize in the Tiburtius Prizes 2020 of the Berlin Universities LKRP Berlin
For the PhD thesis
- 2020-22 FSMP Postdoctoral Fellowship Foundation Sciences Mathématiques de Paris
Call of 2020 in the "interactions" program
- 2017-19 BMS Doctoral Fellowship BMS and Einstein Foundation
- 2019 Special Award to Young Researchers presenting Posters MEGA 2019
One out of three given awards
- 2018 First Prize in the End of Studies Spanish National Award Spanish Government
In recognition of academic achievements during B. Mathematics
- 2014-16 Beca de "la Caixa" para estudios de posgrado en universidades europeas
Jointly awarded by Obra Social "la Caixa" and DAAD in 2014 for BMS Phase I.

papers and preprints

- 2021 Functional norms, condition numbers and numerical algorithms in algebraic geometry arXiv:2102.11727
With Felipe Cucker and Alperen A. Ergür.
- 2020 Condition Numbers for the Cube. I: Univariate Polynomials and Hypersurfaces arXiv:2006.04423
With Elias Tsigaridas. Conference version at ISSAC'20.
- 2020 On the Complexity of the Plantinga-Vegter Algorithm arXiv:2004.06879
With Felipe Cucker and Alperen A. Ergür. Journal version of ISSAC'19 paper.
- 2019 Computing the Homology of Semialgebraic Sets. II: General Formulas J.FoCM
With Peter Bürgisser and Felipe Cucker. arXiv:1903.10710
- 2019 Plantinga-Vegter algorithm takes average polynomial time ISSAC 2019
With Felipe Cucker and Alperen A. Ergür. arXiv:1901.09234
- 2019 On the Number of Real Zeros of Random Fewnomials SIAGA
With Peter Bürgisser and Alperen A. Ergür. arXiv:1811.09425
- 2018 Computing the Homology of Semialgebraic Sets. I: Lax Formulas J.FoCM
With Peter Bürgisser and Felipe Cucker. arXiv:1807.06435

selected talks

- 2021 SIAM Conference AAG 2021 Texas A&M (On-line)
"What's new in Computational Real Algebraic Geometry? (Introductory Talk)"
- 2021 MEGA 2019: Effective Methods in Algebraic Geometry UiT (On-line)
"A numerical algorithm for zero counting. IV: An adaptive speedup"
- 2021 MEGA 2019: Effective Methods in Algebraic Geometry UiT (On-line)
"Functional norms, condition numbers and numerical algorithms in algebraic geometry" (Together with F. Cucker and A.A. Ergür)
- 2021 Tutorial-a-thon of the Applied Algebraic Topology Network On-line
"The Niyogi-Smale-Weinberger Theorem & its relatives"
- 2020 ISSAC 2020 On-line
"Condition Numbers for the Cube. I: Univariate Polynomials and Hypersurfaces"
- 2019 Complexity of Numerical Computation: A conference in honor of Felipe Cucker BBWA
"Average minus Weak Complexity equals Adaptive algorithms"
- 2019 ISSAC 2019 Beihang University
"Plantinga-Vegter takes average polynomial time"

selected posters

- 2021 Breaking the Curse of Infinite Average Run-Time in Numerical Real Algebraic Geometry, can the Adaptive Grid Method do the Job? Texas A&M (On-line)
Presented at *SIAM Conference AAG 2021*
- 2021 Computing the Homology of Semialgebraic Sets via TDA IMSI (On-line)
Presented at *Workshop on Topological Data Analysis*
- 2019 Computing the Homology Groups of Closed Semialgebraic Sets in Weak Exponential Time UCM
Presented at *MEGA 2019: Effective Methods in Algebraic Geometry*
Won one out of three Special Awards to Young Researchers presenting Posters
- 2018 Computing the "Shape" of Semialgebraic Sets Embassy of Spain in Berlin
Presented at *Bridging European Science II*

selected organized activities

- 2021 Minisymposium *Computational Real Algebraic Geometry* SIAM Conf. AAG '21
With Cordian Riener
- 2021 S. Session *Symbolic and Numerical Computation with Polynomials* MCA2021
With Diego Armentano, Matías Bender and Alperen A. Ergür
- 2020 3rd BYMAT Conference UV & UPV
Member of the Scientific Committee and of the Poster Committee
- 2016-19 "What is...?" Seminar BMS
Member of the Organizing Committee
- 2019 Minisymposium *Numerical methods for structured polynomial system solving* SIAM Conference AAG 2019
With Alperen A. Ergür, Pierre Lairez and Gregorio Malajovich
- 2018 6th BMS Student Conference (21-23/2) BMS
With BMS Student Representatives of 2017

teaching experience

- 2018 *Effective Algebraic Geometry Seminar* TU Berlin
Organizer together with Peter Bürgisser and Alperen A. Ergür
- 2013-14 Private remedial teacher [~ 156 hours] Centro de Estudios INTEC
Linear algebra lessons to one 1st and one 2nd year mathematics students group
General mathematics lessons to one 1st year chemical engineering students group

popularization of mathematics

- 2015 *Emmy Noether, retrato alfabético* [Spanish] Poem
Published in the blog "mujeres con ciencia" on the 5th of October.
- 2011-14 π kasle [PIkasle] UPV/EHU Math Students' Magazine
Mainly online (with ISSN 2174-9027), but with some issues also on paper.
Founder (together with Ricardo Grande), editor, desktop publisher, cover designer (except in issue number 10), interviewer and sporadic author.
2013 Honor mention in *Ciencia en Acción XIV*
2012 One 1st Prize in the *Image Difussion Student Awards of the UPV/EHU*
- 2014 PIkasle's *Mathematics, Magic and Mystery Workshop* Event
Two sessions during April in UPV/EHU. Organizer (together with Ricardo Grande).
- 2013 PIkasle's Martin Gardner Celebration of Mind Event
Martin Gardner Celebration of Mind in UPV/EHU. Organizer.

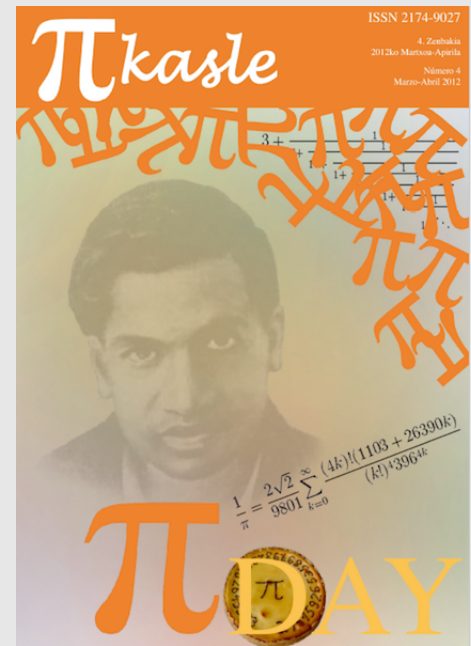
service

- 2015-18 Vocal del Comité de Evaluación de Titulaciones de Ciencias de UNIBASQ
Student evaluator of science degrees
at Agency for Quality of the Basque University System (UNIBASQ)
- 2017 Student Representative of the BMS Berlin Mathematical School
Representation of students at BMS Executive Board and *Mentoring, Gender and Diversity* Committee and organization of students' social events

references

- Peter Bürgisser Technische Universität Berlin
Felipe Cucker CityU Hong Kong
Alperen Ali Ergür Carnegie Mellon University
Elias Tsigaridas Inria Paris & IMJ-PRG

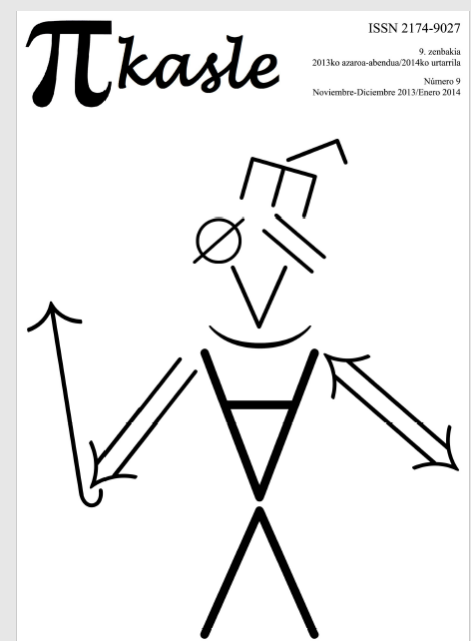
Some designs



π kasle No. 4



π kasle No. 7



π kasle No. 9