



# Josué Tonelli-Cueto

Mathematician  
Postdoc at Inria Paris



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Inria Paris & IMJ-PRG



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illsaidthoughts.xyz

## Interests

- \* Numerical algorithms and condition-based complexity
- \* Computational algebraic geometry
- \* Random geometry

## Languages

Castellano (Spanish) — [Native]



English



Euskera (Basque)



Deutsch (German)



Française (French)



(\*)[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



FORTRAN



MatLab



julia



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

Last update on the 29th of July of 2022.

Profile photo: © Inria / Photo B. Fourrier

## employment & education

- 2022-23 Postdoctoral Fellow UT San Antonio  
Under the mentoship of Alperen A. Ergür
- 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

- 2021 MATH+ Dissertation Award 2020 MATH+, BMS & Einstein Foundation Berlin
- 2020 3rd Prize in the Tiburtius Prizes 2020 of the Berlin Universities LKRP Berlin
- 2020-22 FSMP Postdoctoral Fellowship Fondation Sciences Mathématiques de Paris  
Call of 2020 in the "interactions" program
- 2017-19 BMS Doctoral Fellowship BMS & Einstein Foundation Berlin
- 2019 Special Award to Young Researchers presenting Posters MEGA 2019  
One out of three given awards
- 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

- 2022 Generalized Perron Roots and Solvability of the Absolute Value Equation arXiv:1912.08157  
With Manuel Radons.
- 2022 Ultrametric Smale's  $\alpha$ -theory arXiv:2206.08392  
With Jazz G. Suchen.
- 2022 A  $p$ -adic Descartes solver: the Strassman solver arXiv:2203.07016
- 2022 On the Error of Random Sampling: Uniformly Distributed Random Points on Parametric Curves ISSAC 2022  
With Apostolos Chalkis and Christina Katsamaki. arXiv:2203.02832
- 2022 Beyond Worst-Case Analysis for Root Isolation Algorithms ISSAC 2022  
With Alperen A. Ergür and Elias Tsigaridas. arXiv:2202.06428
- 2022 Probabilistic bounds on best rank-one approximation ratio arXiv:2201.02191  
With Khazhgali Kozhasov.
- 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  
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)
- 2021 SIAM Conference AAG 2021  
"What's new in Computational Real Algebraic Geometry? (Introductory Talk)"  
Texas A&M (On-line)
- 2021 MEGA 2019: Effective Methods in Algebraic Geometry  
"A numerical algorithm for zero counting. IV: An adaptive speedup"  
UiT (On-line)
- 2021 MEGA 2019: Effective Methods in Algebraic Geometry  
"Functional norms, condition numbers and numerical algorithms in algebraic geometry" (Together with F. Cucker and A.A. Ergür)  
UiT (On-line)
- 2021 Tutorial-a-thon of the Applied Algebraic Topology Network  
"The Niyogi-Smale-Weinberger Theorem & its relatives"  
On-line
- 2020 ISSAC 2020  
"Condition Numbers for the Cube. I: Univariate Polynomials and Hypersurfaces"  
On-line
- 2019 Complexity of Numerical Computation: A conference in honor of Felipe Cucker  
"Average minus Weak Complexity equals Adaptive algorithms"  
BBWA
- 2019 ISSAC 2019  
"Plantinga-Vegter takes average polynomial time"  
Beihang University

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

popularization of mathematics

- 2021  
*Semi... ¿qué? Las múltiples formas de lo semialgebraico y cómo determinarlas* [Spanish]  
Presented at divulga NextGen on the 28th of May.  
Video
- 2015  
*Emmy Noether, retrato alfabético* [Spanish]  
Published in the blog "mujeres con ciencia" on the 5th of October.  
Poem
- 2011-14  
*πkasle [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*

service

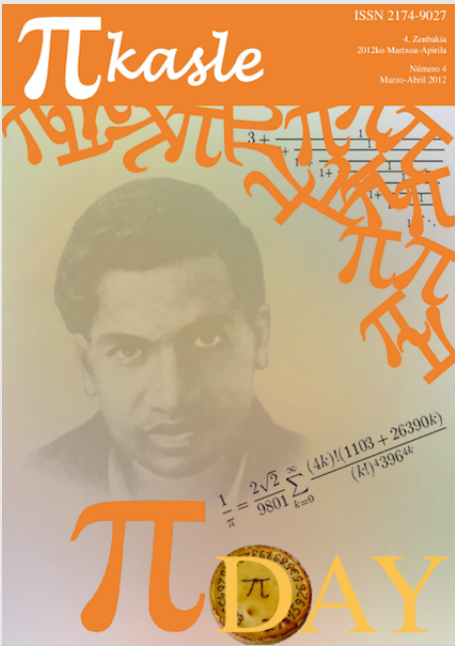
- 2015-18  
Vocal del Comité de Evaluación de Titulaciones de Ciencias de UNIBASQ  
Student evaluator of science degrees  
at Agency for Quality of the Basque University System (UNIBASQ)
- 2017  
Student Representative of the BMS Berlin Mathematical School  
Representation of students at BMS Executive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

references

Peter Bürgisser  
Felipe Cucker  
Alperen Ali Ergür  
Elias Tsigaridas

Technische Universität Berlin  
CityU Hong Kong  
UT San Antonio  
Inria Paris & IMJ-PRG

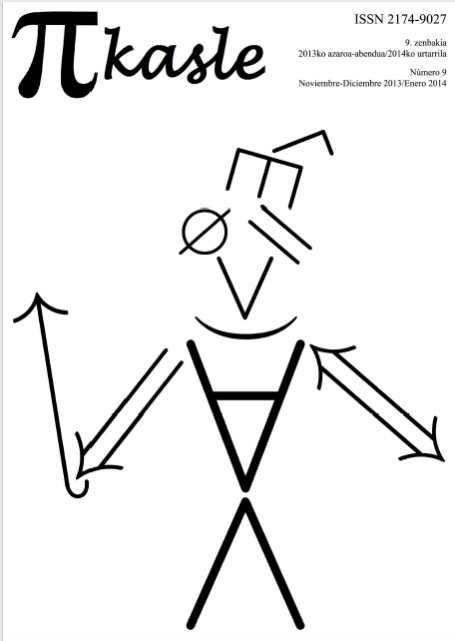
Some designs



πkasle No. 4



πkasle No. 7



πkasle No. 9