



# 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)



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



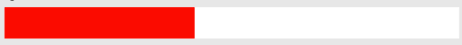
FORTRAN



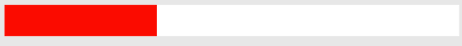
MatLab



julia



R



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

## 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

- 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 Foundation 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 A  $p$ -adic Descartes solver: the Strassman solver arXiv:2203.07016
- 2022 On the sampling error for parametric curves arXiv:2203.02832  
Together with Apostolos Chalkis and Christina Katsamaki.
- 2022 A Near-Optimal Expected Boolean Complexity Bound for Descartes Solver arXiv:2202.06428  
Together with Alperen A. Ergür and Elias Tsigaridas.
- 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  
Member of the Scientific Committee and of the Poster Committee  
UV & UPV
- 2016-19  
"What is...?" Seminar  
Member of the Organizing Committee  
BMS
- 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)  
With BMS Student Representatives of 2017  
BMS

popularization of mathematics

- 2021  
*Semi... ¿qué? Las múltiples formas de lo semialgebraico y cómo determnarlas* [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

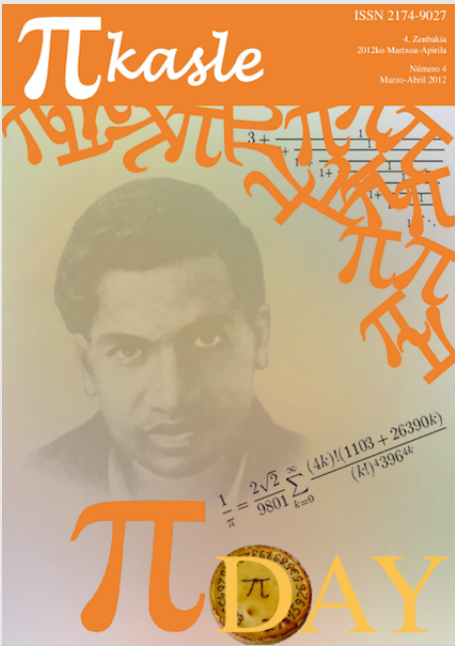
- 2015-18  
Vocal del Comité de Evaluación de Titulaciones de Ciencias de UNIBASQ  
Student evaluator of science degrees  
at Agency for Quality of the Basque University System (UNIBASQ)
- 2017  
Student Representative of the BMS  
Representation of students at BMS Executive Board and *Mentoring, Gender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

references

Peter Bürgisser  
Felipe Cucker  
Alperen Ali Ergür  
Elias Tsigaridas

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

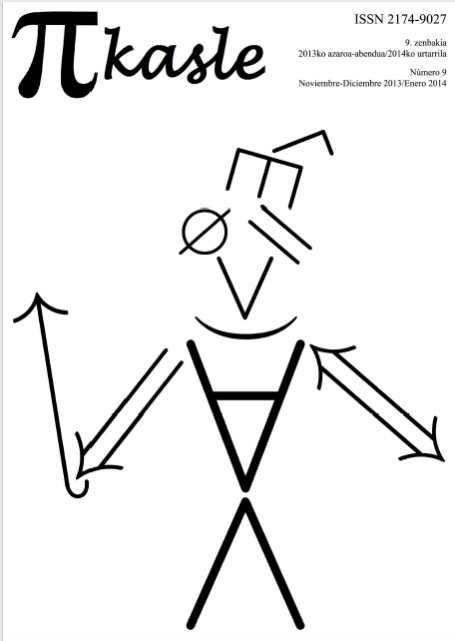
Some designs



πkasle No. 4



πkasle No. 7



πkasle No. 9