



Josué Tonelli-Cueto

Mathematician
BMS PhD Student



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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 1st of November of 2019.

education

- 2017-19 Doctorate in Mathematics (Expected for November of 2019) TU Berlin
Under the supervision of Prof. P. Bürgisser and Prof. F. Cucker.
In the framework of the Berlin mathematical School
- 2014-17 M.Sc. Mathematics TU Berlin
M.'s t. "On the complexity of some Null-Cone Membership Problems" with Prof. P. Bürgisser.
In the framework of the Berlin mathematical School
- 2009-14 Licenciatura en Matemáticas con Premio Nacional Fin de Carrera UPV/EHU
B. Mathematics in the University of the Basque Country.

grants & awards

- 2017-19 BMS Doctoral Fellowship BMS and Einstein Foundation
Within Prof. F. Cucker's Einstein Visiting Fellowship
- 2019 SIAM Student Travel Award SIAM Conference AAG 2019
- 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.
- 2013-14 Beca de Colaboración, para el curso 2013-2014 Basque Government
On "Pro- p and p -adic analytic groups" with Prof. G.A. Fernández-Alcober in UPV/EHU.
- 2013 Beca de Introducción a la Investigación del Programa JAE CSIC
On "Class Field Theory" with Prof. A. Jaikin-Zapirain in ICMAT during the summer.

papers and preprints

- 2019 Computing the Homology of Semialgebraic Sets.
II: General Formulas arXiv:1903.10710
Together with Peter Bürgisser and Felipe Cucker
- 2019 Plantinga-Vegter algorithm takes average polynomial time ISSAC 2019
Together with Felipe Cucker and Alperen A. Ergür.
- 2018 On the Number of Real Zeros of Random Fewnomials arXiv:1811.09425
Together with Peter Bürgisser and Alperen A. Ergür
Accepted at SIAGA
- 2018 Computing the Homology of Semialgebraic Sets. I: Lax Formulas J.FoCM
Together with Peter Bürgisser and Felipe Cucker. arXiv:1807.06435

selected talks

- 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"
- 2019 SIAM Conference AAG 2019 Uni Bern
Farewell to Weyl: Condition-based analysis with a Banach norm in numerical algebraic geometry
- 2019 Workshop MEGAR 2019: Effective Methods in Real Algebraic Geometry UCM
"Numerical Computation of Homology Groups of Closed Semialgebraic Sets"
- 2019 2nd BYMAT Conference: Bringing Young Mathematicians Together ICMAT
"How many zeros does a random fewnomial system have?"
- 2019 Algebra Seminar of the Department of Mathematics UPV/EHU
"Computing the Homology of Semialgebraic Sets in Weak Exponential Time"
- 2019 Random Real Algebraic Geometry Workshop Nesin Matematik Köyü
"On Zeros of Random Fewnomials" (5 talks series)
- 2018 "What is...?" Seminar (with recorded contributed talk) BMS
"What is the best voting system?"
- 2018 1st BYMAT Conference: Bringing Young Mathematicians Together ICMAT
"Computing the homology of closed semialgebraic sets"
- 2018 Oberseminar of the Institut für Algebra und Geometrie OvGU Magdeburg
"Computing the homology of semialgebraic sets"
- 2017 Reading Group on Real Algebraic Geometry MPI MIS Leipzig
"Random real Schubert calculus and lines on surfaces"

selected posters

- 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
- 2019 Computing the Homology of Semialgebraic Sets in Weak Exponential Time UC
Presented at *Congreso Biental de la Real Sociedad Matemática Española*
- 2018 Computing the Homology of Semialgebraic Sets MPI MIS Leipzig
Presented at *Summer School on Numerical Computation in Algebraic Geometry*
- 2018 Computing the "Shape" of Semialgebraic Sets Embassy of Spain in Berlin
Presented at *Bridging European Science II*

selected organized activities

- 2016- "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
- 2014 Course "Group of units in complete discrete valuation rings" [4 hours] UPV/EHU
Organized by the GRECA research group
- 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
- 2012-13 "P vs. NP and related topics" Seminar (Organizer) [30 hours] UPV/EHU
Student seminar covering the Cook-Levin theorem and the AKS primality test.

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 in www.pikastle.com (with ISSN 2174-9027), but with some issues also on paper (with ISSN 2255-5714 and Legal Deposit BI 305-2013).
Founder (together with Ricardo Grande), editor, desktop publisher, cover designer (except in issue number 10), interviewer and sporadic author.
2013 Mención de honor en Ciencia en Acción XIV
Honor mention in the category "Works of popularization of science. Media"
2012 Premio al alumnado de difusión de la imagen de la UPV/EHU.
1st prize in the science category
- 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

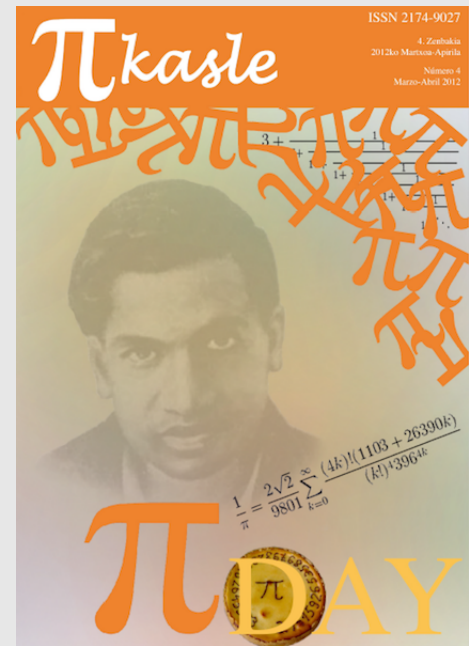
- 2015-18 Vocal del Comité de Evaluación de Titulaciones de Ciencias de UNIBASQ
Student evaluator of science degrees
at Agency for Quality of the Basque University System (UNIBASQ)
- 2017 Student Representative of the BMS Berlin Mathematical School
Representation of students at BMS Executive Board and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

references

Peter Bürgisser
Felipe Cucker
Alperen Ali Ergür
Marta Macho-Stadler

Technische Universität Berlin
CityU Hong Kong
Carnegie Mellon University
University of the Basque Country

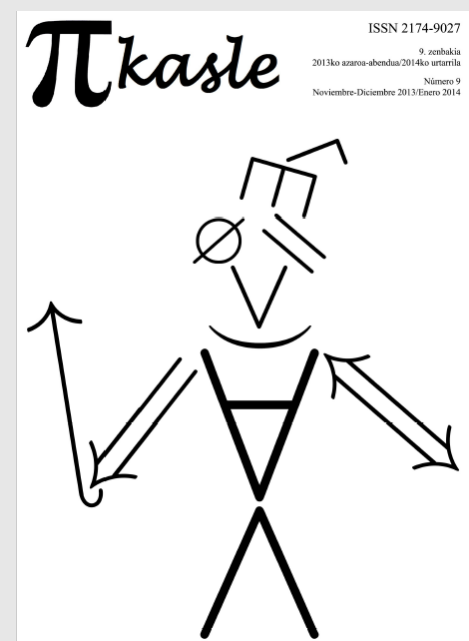
Some designs



π kasle No. 4



π kasle No. 7



π kasle No. 9