

# Josué Tonelli-Cueto

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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.]

# rogramming

FORTRAN GAP

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

Last update on the 9th of February of 2020.

## employment & education

2020-22 FSMP Postdoctoral Fellow IMJ-PRG and Inria Paris In the OURAGAN team with F. Roullier and E. Tsigaridas

2020 Postdoctoral researcher IMJ-PRG and Inria Paris In the OURAGAN team with F. Roullier and E. Tsigaridas

2017-19 Dr. rer. nat. Mathematik (PhD in Mathematics) TII 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 Memebership 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/ЕНU B. Mathematics in the University of the Basque Country.

#### grants & awards

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 Within Prof. F. Cucker's Einstein Visiting Fellowship

SIAM Student Travel Award 2019 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 On "Pro-p and p-adic analytic groups" with Prof. G.A. Fernández-Alcober in UPV/EHU.

Beca de Introducción a la Investigación del Programa JAE 2013 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

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. arXiv:1901.09234

arXiv:1903.10710

J.FoCM

2019 On the Number of Real Zeros of Random Fewnomials SIAGA Together with Peter Bürgisser and Alperen A. Ergür. arXiv:1811.09425

2018 Computing the Homology of Semialgebraic Sets. I: Lax Formulas 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?"

#### selected posters

2019 Computing the Homology Groups

of Closed Semialgebraic Sets in Weak Exponential Time

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 Universe Presented at Congreso Bienal 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 Presented at *Bridging European Science II* 

Embassy of Spain in Berlin

UCM

#### selected organized activities

2016-19 "What is...?" Seminar

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 Bürgiser 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 [ $\sim 156~{
m hours}$ ] 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/EF 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  $\pi$ kasle [PIkasle] UPV/EHU Math Students' Magazine

Mainly online in www.pikasle.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 Ever

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

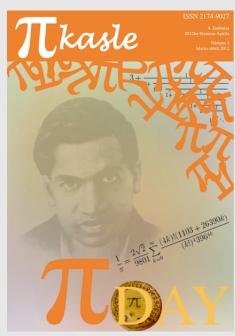
Representation of students at BMS Executive Board and Mentoring, Gender and

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

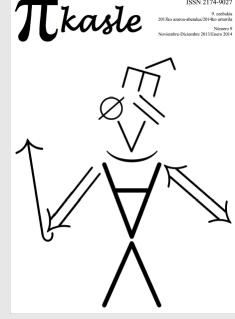
## Some designs —



 $\pi$ kasle No. 4



 $\pi$ kasle No. 7



 $\pi$ kasle No. 9