

# Joan Bruna

---

## CONTACT INFORMATION

+1 917 767 0617  
bruna@cims.nyu.edu  
<http://cims.nyu.edu/~bruna/>

## CITIZENSHIP

Spanish (USA Permanent Resident).

## PROFESSIONAL EXPERIENCE

- Courant Institute of Mathematical Sciences and Center for Data Science, NYU**, New York, NY  
*Associate Professor of Computer Science, Data Science and Mathematics (affiliated)*, **Spring 2021-Now**  
*Assistant Professor of Computer Science, Data Science and Mathematics (affiliated)*, **Fall 2016-Fall 2020**
- Flatiron Institute, Simons Foundation**, New York, NY  
*Visiting Scholar, Center for Computational Mathematics*, **Fall 2020-Now**
- Institute for Advanced Study**, Princeton, NJ  
*Member, School of Mathematics, Year on Optimization and ML*, **Fall 2019-Spring 2020**
- UC Berkeley**, Berkeley, CA  
*Assistant Professor of Statistics, Dept of Statistics*, **Jan 2015 - Aug 2016**
- Facebook AI Research**,  
*Visiting Scientist, Paris*, **May-Aug 2018**  
*Post Doctoral Fellow, New York, NY*, **Oct-Dec 2014**
- Courant Institute, NYU**, New York, NY  
*Postdoctoral Researcher*, **Oct 2012 - Sep 2014**
- CSR**, Malakoff, France  
*Senior Reseach Consultant*, **Oct 2010 - July 2012**
- Zoran**, Malakoff, France  
*Senior Reseach Engineer*, **June 2008 - Sep 2010**
- Let it Wave**, Palaiseau and Malakoff, France.  
*Research Engineer*, **April 2005 to June 2008**

## EDUCATION

- Ecole Polytechnique**, Palaiseau, France  
**Ph.D. in Applied Mathematics**, "Scattering Representations for Recognition" **2013**
  - Thesis Topics: *Invariant signal representations, classification, pattern recognition, stochastic processes, invariance learning, differential geometry.*
  - Adviser: Professor Stéphane Mallat.
- Ecole Normale Supérieure**, Cachan, France  
**MSc "Mathématiques, Vision, Apprentissage" in Applied Mathematics** **2005**
  - Image, audio and video processing, Harmonic analysis, Machine Learning, Wavelet theory.
  - *Mention Très bien.*
- Universitat Politècnica de Catalunya**, Barcelona, Spain  
**BS, MSc Telecommunications Engineering** **2004**
  - Master Thesis developed in Nokia Denmark (Aalborg), 2003-2004.
  - Title: "New Modeling techniques for HSDPA/WCDMA" (*A with honors*).
- BS Mathematics** **2002**
  - *With Honors, Ranked 2nd.*

AWARDS Best Paper Awards: ICLR ML for Climate, 2023, IEEE SPS 2022, International Astrostatistics Association, 2020, ICMLA, 2018.  
NSF CAREER Award, 2019.  
Alfred P. Sloan Research Fellowship, 2018.  
Honors Mention in Spanish Physics Olympiad, 1998  
ENS Cachan Scholarship, 2004-2005  
2nd national place in Cangur Mathematical Contest, 1996

PATENTS EP10703636: Video sequence analysis for robust motion estimation.  
EP10703637: Temporal video interpolation method with 2-frame occlusion handling.  
US 20110096227: Frame Rate Conversion with Motion estimation in a plurality of resolution levels.  
US 20110058106, with M.Shand: Sparse Geometry for super-resolution video processing.  
EP2010/068133: Cadence Detection for Interlaced Video Based on Temporal Regularity.  
US 20100104210, with S.Mallat, N.Laveau, C.Bernard: Method and apparatus for spatio-temporal subband video enhancement with small time-delay.  
US 20090278981, with S.Mallat: Method and apparatus for robust super-resolution video scaling.

## COLLEGIAL

### **Program Committee and Editorial Boards**

2022-present FOCM Editorial Board.  
2022-present TMLR Action Editor.  
2021-present ACHA Editorial Board.  
2021-present IEEE TPAMI Action Editor.  
2020-present JMLR Action Editor.  
2020-present NeurIPS Senior Area Chair.  
2022-present ICML Senior Area Chair.  
2021-present COLT Senior Program Committee.  
2020-present MSML PC.  
2021 MSML General Chair.  
2017-present ICLR Area Chair.  
2020 IEEE TPAMI Special Issue Editor.  
2020 Journal of Mathematical Imaging and Vision Special Issue.  
2017-2019 NeurIPS Area Chair.  
2017-2021 ICML Area Chair.  
2016-2017 AISTATS Area Chair.

### **Workshop and Seminar Organisation**

2021 Simons Math+X Symposium on Exoplanets, Inverse Problems and Deep Learning, Costa Rica.  
2020 Simons Math+X Symposium on Natural Hazards, Inverse Problems and Deep Learning, Costa Rica.  
2020 Math and Data+, NYU and ETH. (Virtual Seminar)  
2019 Inverse Problems and Deep Learning Workshop, NeurIPS.  
2019 Mathematics of Deep Learning (DeepMath).  
2019 IAS Workshop on Theory of Deep Learning.  
2019 MIFODS "Deep Learning and Non-convex Optimization" Workshop, MIT.  
2019 Simons Math+X Symposium on Space Exploration, Inverse Problems and Deep Learning, Rice U.  
2019 "Theoretical Physics and Deep Learning Workshop", ICML.  
2019 "Machine Learning for Network Data" Workshop, New York.  
2018 "Representation Learning on Graphs and Manifolds".  
2018 "New Deep Learning Techniques", IPAM, Los Angeles.  
2018 KDD Deep Learning Day, co-organiser of inaugural event.  
2017-present Math and Data Seminar, co-founder.  
2016 Machine Learning Summer School, Cadiz.

## Full Tutorials

Mathematics of Deep Learning: ICCV, 2015, CVPR 2016, ECCV 2016, CVPR 2017, ICCV 2017.

Geometric Deep Learning: CVPR 2017, NeurIPS 2017.

## MENTORING

### PhD Students

- 2022-present Noah Amsel (CS, co-advised with Chris Musco).
- 2020-present Lei Chen (CS).
- 2018-present Aaron Zweig (CS).
- 2019-present Carles Domingo (CS).
- 2019-present Karl Otness (CS, co-advised with Benjamin Peherstorfer).
- 2018-2023 David Branfonbrener (CS).
- 2018-2023 Min Jae Song (CS, co-advised with Oded Regev).
- 2018-2023 Samy Jelassi (Princeton ORFE).
- 2018-2022 Zhengdao Chen (Math).
- 2017-2022 Cinjon Resnik (CS, co-advised with Kyunghyun Cho).
- 2017-2021 Luca Venuri (Math).
- 2018-2021 Francis Williams (CS, co-advised with Denis Zorin).

### Postdocs

- 2020-2022 Alberto Bietti (CDS).
- 2021-2022 Tom Tirer (CDS).
- 2019-2019 Arthur Mensch (CDS).
- 2019-2021 Yossi Arjevani (CDS).
- 2018-2020 Matthew Trager (CDS).

## TEACHING

- Spring 2022 : CSCI-GA-3033-020 (NYU): Mathematics of Deep Learning.
- Fall 2021 : Barcelona Graduate School of Mathematics: Algorithmic Learning and Deep Neural Networks
- Fall 2021 : CS NYU: Deep Learning
- Spring 2021 : CSCI-GA-3033-020 (NYU): Mathematics of Deep Learning.
- Fall 2020 : DS-GA 1005 (NYU): Inference and Representation.
- Spring 2020 : CSCI-GA-3033-020 (NYU): Mathematics of Deep Learning
- Spring 2019 : CSCI-GA-3033-020 (NYU): Mathematics of Deep Learning
- Fall 2018 : DS-GA 1005 (NYU): Inference and Representation.
- Spring 2018 : CSCI-GA-3033-020 (NYU): Mathematics of Deep Learning
- Fall 2017 : DS-GA 1005 (NYU): Inference and Representation.
- Fall 2016 : DS-GA 1005 (NYU): Inference and Representation.
- Spring 2016 : Stat 212b (UC Berkeley): Topics in Deep Learning.
- Fall 2015 : Stat 153 (UC Berkeley): Time Series.
- Spring 2015 : Stat 135 (UC Berkeley): Mathematical Statistics.