

# Pierrick Bousseau

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## *Curriculum Vitae*

### Personal Information

Address: ETH Zürich, Department of Mathematics  
E-mail: pbousseau@ethz.ch  
Nationality: French

### Employment

- 01.2022 – present **Assistant Professor**, *ETH Zürich*  
09.2020 – present **Chargé de recherche**, *CNRS, Laboratoire de Mathématiques d'Orsay, Université Paris-Sud (on leave)*  
09.2018–08.2020 **Junior fellow (postdoc)**, *ETH Zürich, Institute for Theoretical Studies*

### Education

- 2014 – 2018 **PhD in Mathematics**, *Imperial College London*  
Supervisor: Richard Thomas  
2013 – 2014 **ENS Diploma**, *École Normale Supérieure de Paris*  
Major in Mathematics, Minor in Physics  
2011 – 2013 **MSc in Mathematics**, *École Normale Supérieure de Paris, Paris 11*  
With highest distinction  
2010 – 2011 **BSc in Physics**, *École Normale Supérieure de Paris, Paris 11*  
With highest distinction  
2010 – 2011 **BSc in Mathematics**, *École Normale Supérieure de Paris, Paris 11*  
With highest distinction  
2008 – 2010 **MPSI-MP\***, *Lycée Louis le Grand, Paris*  
Preparatory classes for the Grandes Ecoles, Mathematics, Physics, Computer Science  
2008 **French Baccalauréat**  
High school qualification, with highest distinction

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## Grants and honors

- 2022-2027 **European Union ERC starting grant**, *grant number: 101039837*  
This award (1.4 Million Euros) will pay for 2 PhD students, 3 postdocs for a period of 5 years. These grants are highly competitive, with roughly 12 awards per year in mathematics across Europe.
- 2021-2022 **Laureate of the Peccot Lecture**  
Distinction each year given to one French mathematician under 30 years old for their promising work [Cours Peccot 2021-2022 du Collège de France](#).
- 2020 **SwissMAP Innovator Prize**  
Awarded to PhD students or postdocs for important scientific achievements in the research areas of the Swiss National Centre of Competence in Research SwissMAP-The Mathematics of Physics
- 2019 **Yael Naim Dowker Centenary Prize in Mathematics**  
Awarded by Imperial College, London to graduate students with an outstanding PhD thesis.
- 2018 **Doris Chen PhD Merit Award**  
Awarded by Imperial College, London to graduate students for their outstanding achievements.
- 2017 **Young Scientist Award of the Journal of Geometry and Physics**  
For a presentation at the Workshop on Algebraic Geometry and Physics, SISSA.
- 2014 **PhD Scholarship from Imperial College London**
- 2010 **Admission to the École Normale Supérieure de Paris (ENS)**
- 2009 **Silver Medal**  
International Physics Olympiads (IPHO)
- 2008 **1<sup>st</sup> Prize winner at Concours général de Physique**  
French national competition in Physics

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## Papers

- 2017 *Refined tropical curve counting from higher genera and lambda classes* arXiv:1706.07762, **Inventiones Mathematicae**, 215(1), 1-79, 2019.
- 2018 *The quantum tropical vertex* arXiv:1806.11495, **Geometry and Topology**, 24(3) 1297-1379, 2020.
- 2018 *Quantum mirrors of log Calabi-Yau surfaces and higher genus curves counting* arXiv:1808.07336, **Compositio Mathematica**, 156(2), 360-411, 2020.
- 2018 *On an example of quiver Donaldson-Thomas/relative Gromov-Witten correspondence* arXiv:1811.02448, **International Mathematics Research Notices**, 2021(15), 11845-11888, 2021.
- 2019 *Refined floor diagrams from higher genera and lambda classes* arXiv:1904.10311, **Selecta Mathematica**, 27(3), 1-42, 2021.
- 2019 *On the log-local principle for the toric boundary*, 20 pages, arXiv:1908.04371, accepted for publication in the **Bulletin of the London Mathematical Society**.

- 2019 *Scattering diagrams, stability conditions, and coherent sheaves on  $P^2$* , 83 pages, arXiv:1909.02985, accepted for publication in the **Journal of Algebraic Geometry**.
- 2020 *A proof of N. Takahashi's conjecture for  $(P^2, E)$  and a refined sheaves/Gromov–Witten correspondence*, 48 pages, arXiv:1909.02992, submitted.
- 2020 *Holomorphic anomaly equation for  $(P^2, E)$  and the Nekrasov–Shatashvili limit of local  $P^2$* , joint with Honglu Fan, Shuai Guo, and Longting Wu, arXiv:2001.05347, **Forum of Mathematics, Pi**, 9, E3. doi:10.1017/fmp.2021.3, 2021.
- 2020 *Real Log Curves in Toric Varieties, Tropical Curves, and Log Welschinger Invariants*, joint with Hülya Argüz, to appear in **Annales de l'Institut Fourier**.
- 2020 *Stable maps to Looijenga pairs: orbifold examples*, joint with Andrea Brini and Michel van Garrel, 26 pages, arXiv:2012.10353, accepted for publication in **Letters in Mathematical Physics**, 2021.
- 2020 *Scattering diagrams, sheaves and curves*, **Acta Mathematica Sinica, English Series**, 37(7), 1005–1022, 2021.
- 2020 *Strong positivity for the skein algebras of the 4-punctured sphere and of the 1-punctured torus*, 59 pages, preprint arXiv:2009.02266, submitted.
- 2020 *Stable maps to Looijenga pairs*, joint with Andrea Brini and Michel van Garrel, 114 pages, arXiv:2011.08830, submitted.
- 2021 *The flow tree formula for Donaldson–Thomas invariants of quivers with potentials*, joint with Hülya Argüz, 50 pages, preprint arXiv:2102.11200, submitted.
- 2021 *Gromov–Witten invariants of complete intersections*, joint with Hülya Argüz, Rahul Pandharipande, and Dimitri Zvonkine, 90 pages, preprint arXiv:2109.13323, submitted.
- 2022 *Fock–Goncharov dual cluster varieties and Gross–Siebert mirrors*, joint with Hülya Argüz, 46 pages, preprint arXiv:2206.10584, submitted.

## Invited Talks at International Conferences

- 2022 **Workshop on geometric representation theory, Cluster varieties and mirror symmetry**, 22 June 2022, University of Paris, France.
- 2022 **Workshop on Quantum Geometry, Gromov–Witten theory of complete intersections**, 2 talks, 26–27 April 2022, IHES, France.
- 2022 **Workshop on Quivers, Calabi–Yau threefolds and DT Invariants, D-branes on local  $P^2$  revisited**, 12 April 2022, Jussieu, Paris, France.
- 2022 **Recent Advances on Moduli Spaces of Curves, Gromov–Witten theory of complete intersections**, 21 March 2022, Leysin, Switzerland.
- 2021 **Workshop in honour of Lothar Göttsche's 60th birthday, The flow tree formula for DT invariants of quivers with potentials**, 14 December 2021, online.
- 2021 **IHES Summer School on Enumerative Geometry, Physics and Representation Theory, The skein algebra of the 4-punctured curve from curve counting**, 5 July 2021, Paris, France.

- 2021 **Conference on BPS states, mirror symmetry, and exact WKB**, *The flow tree formula for DT invariants of quivers with potentials*, 2 lectures on 30 June and 1 July 2021, Sheffield, UK.
- 2021 **Summer school of the ANR "Symplectic, real, and tropical aspects of enumerative geometry**, *Aspects of refined enumerative geometry*, 5 hours lecture series, 14-17 June 2021, Le Croisic, France.
- 2021 **Swiss Map site visit conference**, *The flow tree formula for quivers with potentials*, 25 May 2021, online organised by Swiss Map, Switzerland.
- 2020 **FRG Workshop on Moduli Spaces and Stability**, *A scattering diagram for coherent sheaves on the projective plane*, 7 December 2020, online hosted by University of Illinois Chicago, USA.
- 2020 **Simon's Collaboration Conference on Floer-theoretic and algebro-geometric aspects of SYZ mirror symmetry**, *Skein algebras from higher genus mirror symmetry*, 1 October 2020, online organised by the Simon's Collaboration on Homological Mirror Symmetry, USA.
- 2020 **7th annual SwissMAP General Meeting**, *Strong positivity for the skein algebras of the 4-punctured sphere and of the 1-punctured torus*, 7 September 2020, online organised by Swiss Map, Switzerland.
- 2020 **Hausdorff School on Perverse Sheaves in Enumerative Geometry**, *Quasimodular forms from Betti numbers*, 10 February 2020, Hausdorff Center for Mathematics, Bonn, Germany.
- 2020 **5th KTGU Workshop**, *Quasimodular forms from Betti numbers*, 7 February 2020, Kyoto University, Japan.
- 2020 **Rencontres en géométrie énumérative et réelle**, *Quasimodular forms from Betti numbers*, 21 January 2020, Université de Nantes, France.
- 2019 **Beijing-Zurich Moduli Workshop**, *Scattering diagrams, sheaves on  $P^2$  and curves in  $P^2$  relative to a smooth cubic*, 9-12 September 2019, 3 hours lecture series at BICMR, Beijing, China.
- 2019 **Workshop on Mirror symmetry and cluster algebras**, *Towards DAHA from tropical geometry*, 15 July 2019, Cambridge, UK.
- 2019 **Oberwolfach Workshop on Logarithmic Enumerative Geometry and Mirror Symmetry**, *A proof of a conjecture of N. Takahashi*, 17 June 2019, Oberwolfach, Germany.
- 2019 **Summer School on New Perspectives in Gromov-Witten Theory**, *A proof of Takahashi's conjecture*, 4 June 2019, Sorbonne Université, Paris, France.
- 2019 **Oberwolfach Workshop on Tropical Geometry: new directions**, *Tropical geometry and coherent sheaves on the projective plane*, 3 May 2019, Oberwolfach, Germany.
- 2019 **Conference on Moduli in Budapest**, *On the Betti numbers of moduli spaces of semistable sheaves on the projective plane*, 4 April 2019, Budapest, Hungary.
- 2019 **Conference on Mirror symmetry and related topics**, *Higher genus wall-crossing and quantization*, 28 January-2 February 2019, Miami, USA.

- 2018 **Tropical geometry in Europe**, *Quantum mirrors of log Calabi-Yau surfaces and higher genus curve counting*, 21-23 November 2018, Nantes, France.
- 2018 **Workshop on Geometry and Mathematical Physics**, *The quantum tropical vertex*, 09 July 2018, Warwick University, UK.
- 2018 **MSRI Workshop on Structures in Enumerative Geometry**, *Quantum mirrors of log Calabi-Yau surfaces and higher genus curves counting*, 22 March 2018, Berkeley, UK.
- 2017 **Conference on Open Gromov-Witten theory, integrable hierarchies and mirror symmetry**, *Quantum mirrors of log Calabi-Yau surfaces and higher genus curves counting*, 17-20 October 2017, ETH, Zurich, Switzerland.
- 2017 **Modern Moduli Theory Graduate School**, *DT invariants from holomorphic curves and a geometric interpretation of Block-Göttsche invariants*, 20 September 2017, ETH, Oxford, UK.
- 2017 **Workshop on Algebraic Geometry and Physics**, *DT invariants from holomorphic curves and a geometric interpretation of Block-Göttsche invariants*, 20 June 2017, SISSA, Trieste, Italy.
- 2016 **Workshop on Curves on surfaces and 3-folds**, *Around the GW/Kronecker correspondence*, 21 June 2016, EPFL, Lausanne, Switzerland.
- 2014 **ERC - FIRB workshop Mirror symmetry, Enumerative Geometry and Related Topics**, 27 May 2014, Pavia, Italy.

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## Invited Talks at Research Seminars

- 2021 **Algebraic geometry and number theory seminar**, 25 November 2021, online, hosted by the Institute of Science and Technology Austria (IST Austria).
- 2021 **ETH Algebraic Geometry and Moduli Seminar**, 17 November 2021, online, hosted by ETH Zürich.
- 2021 **Algebraic Geometry in String Theory seminar**, 16 November 2021, online, hosted by Harvard CMSA.
- 2021 **EPFL seminar**, 11 November 2021, EPFL, Lausanne.
- 2021 **Seminar in Real and Complex Geometry**, 4 November 2021, online, hosted by Tel-Aviv University.
- 2021 **Séminaire d'algèbre**, 7 June 2021, online, hosted by IMJ-PRG, Paris.
- 2021 **KIAS Weekly Geometry Seminar**, 27 May 2021, online, hosted by KIAS, Seoul.
- 2021 **Joint Harvard-CUHK-YMSC Differential Geometry Seminar**, 6 April 2021, online.
- 2021 **Geometry, Symmetry and Physics seminar**, 23 February 2021, online, hosted by Yale University.
- 2021 **Colloquium of the ZMP, Hamburg**, 18 February 2021, online, hosted by the University of Hamburg.

- 2021 **Séminaire Géométrie algébrique**, 2 February 2021, *Laboratoire de Mathématiques de Versailles*.
- 2021 **Derived algebraic geometry seminar**, 13 January 2021, *online*.
- 2020 **Boston University Geometry and Physics Seminar**, 3 December 2020, *online*.
- 2020 **Séminaire d'Analyse et Géométrie**, 17 November 2020, *online*.
- 2020 **Northwestern Geometry and Physics Seminar**, 13 November 2020, *online*.
- 2020 **Berkeley Informal String Math Seminar**, 3 November 2020, *online*.
- 2020 **Greater Washington Topology Seminar**, 23 October 2020, *online*.
- 2020 **Séminaire Arithmétique et Géométrie Algébrique**, 6 October 2020, *Université Paris-Saclay*.
- 2020 **UBC Algebraic Geometry Seminar**, 2 October 2020, *online*.
- 2020 **ETH Algebraic Geometry and Moduli Seminar**, 25 September 2020, *online*.
- 2020 **Working group on scattering diagrams**, 18 June 2020, *online*.
- 2020 **ETH Zoominar**, 3 June 2020, *online*.
- 2020 **University of California San Diego Algebraic Geometry Seminar**, 15 May 2020, *online*.
- 2020 **EDGE Algebraic Geometry Seminar**, 12 May 2020, *online*.
- 2020 **Trieste Algebraic Geometry Seminar**, 6 May 2020, *online*.
- 2020 **Seminar of Physical Mathematics**, 13 January 2020, *Heidelberg University*.
- 2019 **Séminaire Fables Géométriques**, 4 November 2019, *Geneva University*.
- 2019 **ETH Algebraic Geometry and Moduli Seminar**, 30 October 2019.
- 2019 **Algebraic Geometry Seminar**, 22 October 2019, *Warwick University*.
- 2019 **Algebraic Geometry Seminar**, 17 October 2019, *Sheffield University*.
- 2019 **Séminaire de Géométrie Algébrique**, 14 June 2019, *Université d'Angers*.
- 2019 **ETH Algebraic Geometry and Moduli Seminar**, 29 Mai 2019, *ETH Zürich*.
- 2019 **London Geometry and Topology Seminar**, 10 Mai 2019, *Imperial College London*.
- 2019 **Algebraic Geometry Seminar**, 7 Mai 2019, *Imperial College London*.
- 2019 **Berkeley Algebraic Geometry Seminar**, 19 April 2019, *University of Berkeley*.
- 2019 **Algebraic Geometry Seminar**, 11 April 2019, *University of Texas at Austin*.
- 2019 **Séminaire de Géométrie Énumérative**, 8 February 2019, *Sorbonne Université, Jussieu*.
- 2018 **Séminaire Arithmétique et Géométrie Algébrique**, 11 December 2018, *Orsay*.
- 2018 **Topology and Geometry Seminar**, 4 December 2018, *Hebrew University, Jerusalem*.
- 2018 **Algebraic Geometry and Moduli Seminar**, 5 October 2018, *ETH Zurich*.
- 2018 **KCL/UCL Geometry Seminar**, 7 February 2018, *University College London*.

- 2017 **Algebraic Geometry Seminar**, 22 November 2017, University of Hamburg.
- 2017 **Algebraic Geometry Seminar**, 31 October 2017, Warwick University.
- 2017 **Algebraic Geometry Seminar**, 24 October 2017, Sheffield University.
- 2017 **Séminaire de géométrie tropicale**, 11 October 2017, Jussieu, Paris.
- 2017 **Séminaire d'Analyse et Géométrie**, 10 October 2017, Jussieu, Paris.
- 2017 **The London Geometry and Topology Seminar**, 16 June 2017, London.
- 2017 **ETH Algebraic Geometry and Moduli Seminar**, 3 March 2017, Zürich.
- 2016 **Cambridge Algebraic Geometry Seminar**, 19 October 2016, Cambridge.
- 2016 **KIAS Algebraic Geometry Seminar**, 2 March 2016, Seoul.

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## Teaching and Supervision

- 2020 **Supervision of a master's student Master thesis at ETH Zurich**, *Thesis title: Hilbert schemes of Points on 3-folds, by Felix Thimm, February-September 2020.*
- 2020 **Lecture series on the Tropical Vertex at Kyoto University**, 5 hours, February 2020.
- 2020 **Supervision of a master's student at ETH Zurich**, *Topic: cohomology of sheaves, September-December 2019*
- 2019 **Short course on tropical geometry, log geometry, and applications to Gromov-Witten theory**, 5 hours, 20 February-1 March 2019, ETH Zurich
- 2018 **Teaching assistant**, *Demonstrating recitations and marking for the second year course M2PM5: Metric spaces and topology*, Imperial College London, Lecturer: Professor Tom Coates
- 2018 **Teaching assistant**, *Demonstrating recitations and marking for the second year course M2AA1: Differential equations*, Imperial College London, Lecturer: Professor Sebastian van Strien
- 2017 **Teaching assistant**, *Demonstrating recitations and marking for the second year course M2AA2: Multivariable Calculus*, Imperial College London, Lecturer: Professor Andrew Walton
- 2017 **Teaching assistant**, *Demonstrating recitations and marking for the second year course M2PM2: Algebra II*, Imperial College London, Lecturer: Professor Martin Liebeck
- 2017 **Teaching assistant**, *Inviligation for Imperial College exams*, Imperial College London, Spring 2017
- 2017 **Teaching assistant**, *Demonstrating recitations and marking for the second year course M2AA1: Differential equations*, Imperial College London, Lecturer: Professor Sebastian van Strien
- 2016 **Teaching assistant**, *Demonstrating recitations and marking for the third year course M3P14: Elementary Number Theory*, Imperial College London, Lecturer: Doctor David Helm
- 2016 **Teaching assistant**, *Demonstrating recitations and marking for the second year course M2PM2: Algebra 2*, Imperial College London, Lecturer: Doctor John Britnell
- 2016 **Teaching assistant**, *Demonstrating recitations and marking for the second year course M2PM1: Real Analysis*, Imperial College London, Lecturer: Professor Michael Ruzhansky
- 2016 **Teaching assistant**, *Demonstrating recitations and marking for the second year course M2PM3: Complex Analysis*, Imperial College London, Lecturer: Professor Ari Laptev
- 2016 **Teaching assistant**, *Demonstrating recitations and marking for the first year course M1F: Foundations of Analysis*, Imperial College London, Lecturer: Professor Alessio Corti



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## Conference organization

- 2017 Co-organizer of the British Isle Workshop, "Higgs bundles: algebraic and differential geometric perspectives", 2nd - 8th April 2017, Isle of Wight

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## Service

- 2020-present Reviewer for AMS Mathematical Reviews
- 2022 Refereeing for *Selecta Mathematica* and *Inventiones Mathematicae*.
- 2021 Refereeing for the *Journal of Algebra*, *Compositio Mathematica*, *Inventiones Mathematicae*, *Journal of Algebraic Geometry*, *Geometry and Topology*, and *Letters in Mathematical Physics*.
- 2020 Refereeing for *International Mathematics Research Notices*, *Selecta Mathematica*, *Journal de l'École polytechnique* and the *Journal of the London Mathematical Society*.
- 2019 Refereeing for *Transactions of the American Mathematical Society*, *International Mathematics Research Notices* and *Proceedings of the American Mathematical Society*.
- 2018 Refereeing for *Le Journal de l'Institut de Mathématiques de Jussieu* and *International Mathematics Research Notices*.

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## Languages

- English fluent
- French native
- German intermediate