

Antoine BOURGET

PERSONAL DATA

PLACE AND DATE OF BIRTH: Colombes, France | 3 January 1989
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WEBSITE: antoinebourget.org
LANGUAGES: French, English, Spanish (fluent) – Chinese (intermediate).

WORK EXPERIENCE

Current | CEA, Institut de Physique théorique, Saclay, France
OCT 2021 | and ÉCOLE NORMALE SUPÉRIEURE, Paris, France
Junior Research Chair

SEP 2021 | IMPERIAL COLLEGE, London, UK
OCT 2018 | *Postdoctoral researcher in High Energy Physics*

SEP 2018 | UNIVERSITY OF OVIEDO, Spain
SEP 2016 | *Postdoctoral researcher in High Energy Physics*

AUG 2016 | ÉCOLE NORMALE SUPÉRIEURE, Paris, France
SEPT 2013 | *PhD in High Energy Physics*

Current | MINISTRY OF ECONOMIC AFFAIRS, Paris, France
SEP 2011 | *Ingénieur du Corps des Mines (en détachement).*

AUG 2012 | FASTLITE, Orsay, France
OCT 2011 | *Research Engineer*

EDUCATION

Jul 2016 | PhD, ÉCOLE NORMALE SUPÉRIEURE, Paris, France
Mention très bien avec les félicitations du jury
Thesis: Modularity and Vacua in $\mathcal{N} = 1^*$ Supersymmetric Gauge Theories
Advisor: Jan Troost
Examiners: O. Aharony, C. Bachas, A. Hanany, M. Petrini, S.P. Kumar, H. Samtleben

2011-2012 | ÉCOLE NATIONALE SUPÉRIEURE DES MINES, Paris, France
Admission to the *Corps des Mines* (rank 3).

2008-2011 | ÉCOLE POLYTECHNIQUE, Palaiseau, France
Major in Mathematics and Theoretical Physics. GPA: 4.0
Admission from the MP* Classe Préparatoire (rank 2).

TEACHING

January 2021	50th British Universities Summer School in Theoretical Elementary Particle Physics (BUSSTEP), Queen Mary University, London.
2020-2021	Lectures on Algebraic singularities in Physics MSc in Quantum Fields and Fundamental Forces Imperial College London.
2014-2016	TA in QUANTUM MECHANICS Undergrad level, ENS Paris.
2015-2016	TA in GENERAL RELATIVITY MSc level, ENS Paris.

I have supervised many students over the last few years (UROP students from Imperial College, Master students from ENS Lyon and ENS Paris).

OUTREACH AND ACTIVITIES

- Channel Scientia Egria on Youtube, filling the gap between undergrad and research level in math and theoretical physics ($> 100,000$ hours total views).
<https://www.youtube.com/user/antoinebrgt>
- Organizer of the workshop at the Simons Center, *5d $N=1$ SCFTs and Gauge Theories on Brane Webs* (2020, postponed in 2021).
<http://scgp.stonybrook.edu/archives/33275>
- Organizer of the String Theory seminars, London Triangle and Polygon seminars (2020-2021).
- Organizer of the Imperial College Theory Group Seminar series (2018-2020).
- Organizer of the SCGSC 2016 ([website](#)).
- Outreach organizations: *I'm a Scientist* (connecting scientists with highschool in the UK), Imperial College Science Forum, TALENS association (maths and physics classes in disadvantaged highschools), Physics for Everyone (lectures at ENS).

PUBLICATIONS

All my publications are available at <https://inspirehep.net/authors/1394491>.

- AB, Julius F. Grimminger, Mario Martone and Gabi Zafrir, *Magnetic quivers for rank 2 theories*. [[arXiv:2110.11365](#)]
- AB and Amihay Hanany, *Hasse diagrams and Higgs branches*, in *The Pollica perspective on the (super)-conformal world*. J.Phys.A 54 (2021) 30, 303001.
[[CERN Document Server](#)]
- AB, Julius F. Grimminger, Amihay Hanany, Rudolph Kalveks, Marcus Sperling and Zhenghao Zhong, *Folding Orthosymplectic Quivers*.
[[arXiv:2107.00754](#)]
- Guillermo Arias-Tamargo, AB and Alessandro Pini, *Discrete gauging and Hasse diagrams*, SciPost Phys. 11 (2021) 2, 026.
[[arXiv:2105.08755](#)]
- AB, Andrew Dancer, Julius F. Grimminger, Amihay Hanany, Frances Kirwan and Zhenghao Zhong, *Orthosymplectic Implosions*, JHEP 08 (2021) 012.
[[arXiv:2103.05458](#)]

- AB, Julius F. Grimminger, Amihay Hanany, Marcus Sperling and Zhenghao Zhong, *Branes, Quivers, and the Affine Grassmannian*.
[arXiv:2102.06190]
- Marieke van Beest, AB, Julius Eckhard and Sakura Schafer-Nameki, *(5d RG-flow) Trees in the Tropical Rain Forest*, JHEP 03 (2021) 241.
[arXiv:2011.07033]
- AB, Simone Giacomelli, Julius F. Grimminger, Amihay Hanany, Marcus Sperling and Zhenghao Zhong, *S-fold magnetic quivers*, JHEP 02 (2021) 054.
[arXiv:2010.05889]
- Marieke van Beest, AB, Julius Eckhard and Sakura Schafer-Nameki, *Symplectic Leaves and 5d Higgs Branches in the Polygonesian Tropical Rain Forest*, JHEP 11 (2020) 124.
[arXiv:2008.05577]
- AB, Julius F. Grimminger, Amihay Hanany, Rudolph Kalveks, Marcus Sperling and Zhenghao Zhong, *Magnetic Lattices for Orthosymplectic Quivers*, JHEP 12 (2020) 092.
[arXiv:2007.04667]
- AB, Julius F. Grimminger, Amihay Hanany, Marcus Sperling, Gabi Zafrir and Zhenghao Zhong, *Magnetic quivers for rank 1 theories*, JHEP 09 (2020) 189.
[arXiv:2006.16994]
- AB, Amihay Hanany, and Dominik Miketa, *Quiver origami: discrete gauging and folding*.
[arXiv:2005.05273]
- AB, Julius F. Grimminger, Amihay Hanany, Marcus Sperling and Zhenghao Zhong, *Magnetic Quivers from Brane Webs with O5 Planes*, JHEP 07 (2020) 204.
[arXiv:2004.04082]
- Philip Argyres, AB and Mario Martone, *On the moduli spaces of 4d $N=3$ SCFTs I: triple special Kähler structure*, arXiv:1912.04926.
[arXiv:1912.04926]
- AB, Santiago Cabrera, Julius F. Grimminger, Amihay Hanany and Zhenghao Zhong, *Brane Webs and Magnetic Quivers for SQCD*, JHEP 03 (2020) 176.
[arXiv:1909.00667]
- AB, Santiago Cabrera, Julius F. Grimminger, Amihay Hanany, Marcus Sperling, Anton Zajac and Zhenghao Zhong, *The Higgs Mechanism - Hasse Diagrams for Symplectic Singularities*, JHEP 01 (2020) 157.
[arXiv:1908.04245]
- Philip Argyres, AB and Mario Martone, *Classification of all $N \geq 3$ moduli space orbifold geometries at rank 2*, SciPost Phys. 9 (2020) 083.
[arXiv:1904.10969]
- Guillermo Arias-Tamargo, AB, Alessandro Pini and Diego Rodríguez-Gómez, *Discrete gauge theories of charge conjugation*, Nucl.Phys. B946 (2019) 114721.
[arXiv:1903.06662]
- AB, Diego Rodríguez-Gómez and Jorge Russo, *Universality of Toda equation in $N=2$ superconformal field theories*, JHEP 1902 (2019) 011.
[arXiv:1810.00840]
- AB, Alessandro Pini and Diego Rodríguez-Gómez, *Gauge theories from principally extended disconnected gauge groups*, Nucl.Phys. B940 (2019) 351-376.
[arXiv:1804.01108]

- AB, Diego Rodríguez-Gómez and Jorge Russo, *A limit for large R-charge correlators in $N=2$ theories*, JHEP 1805 (2018) 074.
[arXiv:1803.00580]
- AB and Jan Troost, *The Conformal Characters*, JHEP 1804 (2018) 055.
[arXiv:1712.05415]
- AB, Alessandro Pini, Diego Rodríguez-Gómez, *Towards the deconstruction of the type D $(2,0)$ theory*, JHEP **1712** (2017).
[arXiv:1710.10247]
- AB and Jan Troost, *Permutations of Massive Vacua*, JHEP **1705** (2017) 042.
[arXiv:1702.02102]
- AB and Alessandro Pini, *Non-Connected Gauge Groups and the Plethystic Program*, JHEP **1710** (2017) 033.
[arXiv:1706.03781]
- AB and Jan Troost, *The Arithmetic of Supersymmetric Vacua*, JHEP **07** (2016) 036.
[arXiv:1606.01022]
- AB, *Modularity and Vacua in $\mathcal{N} = 1^*$ Supersymmetric Gauge Theory*, July 2016, PhD thesis.
[PDF on tel.archives-ouvertes.fr]
- AB and Jan Troost, *The Covariant Chiral Ring*, JHEP **03** (2016) 163.
[arXiv:1512.03649]
- AB and Jan Troost, *On the $\mathcal{N} = 1^*$ Gauge Theory on a Circle and Elliptic Integrable Systems*, JHEP **01** (2016) 097.
[arXiv:1511.03116]
- AB and Jan Troost, *Counting the massive vacua of $\mathcal{N} = 1^*$ super Yang-Mills theory*, JHEP **1508** (2015) 106.
[arXiv:1506.03222]
- AB and Jan Troost, *Duality and modularity in elliptic integrable systems and vacua of $\mathcal{N} = 1^*$ gauge theories*, JHEP **1504** (2015) 128.
[arXiv:1501.05074]

TALKS AND PRESENTATIONS

- 06/10/2021, Institut de Physique théorique, CEA Saclay, "What is a Magnetic Quiver?"
- 05/10/2021, ENS Paris, Postdoc presentation, "What is a Magnetic Quiver?"
- 23/09/2021, Geometry of (S)QFT, Simons Center for Geometry and Physics, Stony Brook, USA. "Higgs branches after lockdown". [video link]
- 03/08/2021, Nankai Symposium on Mathematical Dialogues, Chern Institute of Mathematics, Nankai University, Tianjin, China. "Branes, Quivers and Affine Grassmannians". [video link]
- 20/07/2021, APCTP Pohang, South Korea, Workshop on Strings, Branes and Gauge Theories. "Non simply laced quivers and Moduli spaces of 4d SCFTs".
- 04/12/2020, QFT and Geometry Seminars, "Moduli space of 5d SCFTs, a walk in the tropical rainforest".
[video link]

- 04/12/2020, Imperial College, "The Higgs branch of 5d SCFTs: updates and challenges".
<https://www.imperial.ac.uk/theoretical-physics/seminars/quiver-meetings/>
- 17/09/2020 SISSA, Workshop on Geometric Correspondences of Gauge Theories X, "Magnetic quivers for rank-1 4d $\mathcal{N} = 4$ theories".
- 17/07/2020 Quiver Meeting, Imperial College, "The Affine Grassmannian and Quivers".
[\[video link\]](#)
- 01/06/2020 Lectures for the Simons Collaboration on Special Holonomy in Geometry, Analysis, and Physics.
[\[video link\]](#)
- 19/12/2019 Rencontres théoriciennes, Institut Henri Poincaré, Paris, France. "Hasse diagrams and Higgs branches".
- 09/12/2019 Joburg Meeting on String theory, "Symplectic Singularities".
- 06/12/2019 Utrecht University, "Hasse diagrams and Higgs branches".
- 25/10/2019 Durham University, "Hasse diagrams and Higgs branches".
- 21/10/2019 University of Oxford, "Hasse diagrams and Higgs branches".
- 09/10/2019 Joint seminar, Institute for Theoretical Physics, Leuven, "Hasse diagrams and Higgs branches".
- 30/09/2019 CEICO, Prague, "Hasse diagrams and Higgs branches".
- 21/05/2019 Oviedo University, "Magnetic quivers and Brane Webs for 4d $\mathcal{N}=2$ SQCD".
- 03/04/2019 DESY, Hamburg, "Brane webs and the SQCD Higgs Branch".
- 30/11/2018 Quiver Meeting, Imperial College, "Computing Hilbert series from free resolutions".
- 09/10/2018 Imperial College London, "Extremal correlators in 4d $\mathcal{N} = 2$ SCFTs and Toda equations".
- 18/07/2018 Albert Einstein Center at the University of Bern, "The importance of being disconnected".
- 02/07/2018 Institut de Physique Nucléaire de Lyon, "Moduli spaces of theories with disconnected gauge groups".
- 05/06/2018 University of Torino, "The importance of being disconnected: principal extension gauge theories".
- 12/02/2018 Oviedo University, "Nilpotent orbits and quiver theories".
- 24/01/2018 Uppsala University, "Towards deconstruction of type D (2,0) theory".
- 22/01/2018 Nordita, "Towards deconstruction of type D (2,0) theory".
- 07/10/2017 Universitat de Barcelona, "Towards deconstruction of type D (2,0) theory".
- 04/12/2017 CPHT, Ecole Polytechnique, "Quivers, Hilbert series and Deconstruction"
- 30/11/2017 LPMT, Tours, "Théories de carquois et Séries de Hilbert"
- 31/10/2017 Università Milano-Bicocca, "Towards deconstruction of type D (2,0) theory"
- 27/09/2017 Imperial College London, "Higgs branch Hilbert series and non-connected gauge groups"

- 04/10/2016 Universidad de Oviedo, "A dance with supersymmetric vacua"
- 01/07/2016 LPTENS (Soutenance de thèse), "Modularity and Vacua in $N=1^*$ supersymmetric gauge theories"
- 10/11/2015 CNAM Paris (RJP), "Do we live in a hologram ?".
- 19/02/2015 LPTHE Jussieu, "Duality and Modularity in Elliptic Integrable Systems".
- 23/05/2014 ENS Paris, "Beyond the Standard Model, an overview".
- 29/01/2014 Student seminar, ENS Paris, "Introduction to string theory".