

FRANCESCO SALA

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Citizenship: Italian
Date of birth: November 11th, 1983

CURRENT POSITION

Università di Pisa, Italy
Assistant Professor (RTDb) December 2019 - present
Kavli Institute for the Physics and the Mathematics of the Universe, Universe of Tokyo, Japan
Visiting Associate Scientist December 2019 - present

EMPLOYMENTS

Kavli Institute for the Physics and the Mathematics of the Universe, Universe of Tokyo, Japan
Postdoctoral Fellow November 2016 - November 2019
University of Western Ontario, London, Canada
Postdoctoral Fellow August 2014 - July 2016
Heriot-Watt University, Edinburgh, United Kingdom
Postdoctoral Research Associate to Prof. R. J. Szabo March 2012 - February 2014

EDUCATION

SISSA, Trieste, Italy and Université Lille 1, France
Ph.D. in Geometry and Doctorat en Mathématiques October 2011
Pures (co-tutorial thesis)
Supervisors: U. Bruzzo and D. Markushevich
Università degli Studi di Trieste, Italy
Master's Degree in Mathematics October 2008
(in collaboration with SISSA) - 110/110 cum laude
Università degli Studi di Palermo, Italy
Bachelor's Degree in Mathematics - 110/110 cum laude July 2006

ADDITIONAL DIPLOMA

SISSA, Trieste, Italy
Diploma "Percorso Formativo Comune" October 2008

PUBLICATIONS

Refereed Articles in Journals:

14. A. Appel and F. Sala. Quantization of continuum Kac–Moody Lie algebras. arXiv:1903.01413. To appear in *Pure and Applied Mathematics Quarterly*.
13. F. Sala and O. Schiffmann. Cohomological Hall algebra of Higgs sheaves on a curve. *Algebraic Geometry*, 2020, 7, no. 3, 346–376.
12. F. Sala and O. Schiffmann. The circle quantum group and the infinite root stack of a curve. With an appendix by T. Kuwagaki. *Selecta Mathematica, New Series*, 2019, no. 5, Art. 77, 86 pp.
11. F. Sala and O. Schiffmann. Fock space representation of the circle quantum group. *International Mathematics Research Notices IMRN*, 2019.

10. P. Eyssidieux and **F. Sala**. Instantons and framed sheaves on Kähler Deligne-Mumford stacks. *Annales de la Faculté des Sciences de Toulouse. Mathématiques. Série 6*, 2018, 27, no. 3, 599-628.
9. M. Pedrini, **F. Sala** and R. J. Szabo. AGT relations for abelian quiver gauge theories on ALE spaces. *Journal of Geometry and Physics*, 2016, 103, 43-89.
8. U. Bruzzo, M. Pedrini, **F. Sala** and R. J. Szabo. Framed sheaves on root stacks and supersymmetric gauge theories on ALE spaces. *Advances in Mathematics*, 2016, 288, 1175-1308.
7. U. Bruzzo, **F. Sala** and R. J. Szabo. $\mathcal{N} = 2$ quiver gauge theories on A-type ALE spaces. *Letters in Mathematical Physics*, 2015, 105, no. 3, 401-445.
6. U. Bruzzo and **F. Sala**. Framed sheaves on projective stacks. With an appendix by M. Pedrini. *Advances in Mathematics*, 2015, 272, 20-95.
5. **F. Sala**. Restriction theorems for μ -(semi)stable framed sheaves. *Journal of Pure and Applied Algebra*, 2013, 217, no. 12, 2320-2344.
4. **F. Sala**. Symplectic structures on moduli spaces of framed sheaves on surfaces. *Central European Journal of Mathematics*, 2012, 10, no. 4, 1455-1471.

Submitted Papers and Preprints:

3. D.-E. Diaconescu, M. Porta and **F. Sala**. McKay correspondence, cohomological Hall algebras and categorification. [arXiv:2004.13685](https://arxiv.org/abs/2004.13685).
2. M. Porta and **F. Sala**. Two-dimensional categorified Hall algebras. [arXiv:1903.07253](https://arxiv.org/abs/1903.07253).
1. A. Appel, **F. Sala**, and O. Schiffmann. Continuum Kac–Moody Lie algebras. [arXiv:1812.08528](https://arxiv.org/abs/1812.08528).
0. **F. Sala** and P. Tortella. Representations of the Heisenberg algebra and moduli spaces of framed sheaves. [arXiv:1004.2814](https://arxiv.org/abs/1004.2814).

EDITORIAL WORK

Editor (with U. Bruzzo and A. Grassi). “Geometric Representation Theory and Gauge Theory”. Cetraro, Italy 2018. Lecture Notes in Mathematics. Fondazione CIME/CIME Foundation Subseries. Springer, 2019.

Special Issue Managing Editor. “Interactions between Geometry and Physics. A topical issue in honor of Ugo Bruzzo’s 60th birthday”, *Journal of Geometry and Physics*, 2017, 118, 1–234.

Guest Editor (with U. Bruzzo). Special issue on “Instanton Counting: Moduli Spaces, Representation Theory and Integrable Systems”, *Journal of Geometry and Physics*, 2016, 109, 1–122.

RECENT VISITING POSITIONS (2017 - 2021)

IHÉS, France. (8 weeks)	June and July 2021 (expected)
MFO, Oberwolfach, Germany. (2 weeks) Research in Pairs Program	November 2020 (expected)
SCGP, Stony Brook, USA. (2 weeks) Program “Geometry and Physics of Hitchin Systems”	2019
Rutgers University, USA. (2 weeks)	2019
University of Edinburgh, UK. (2 weeks)	2018
Université de Strasbourg, France. (2 weeks)	2018
Université de Paris-Sud, Paris, France. (2 weeks)	2018
MIT, USA. (2 weeks)	2017
SISSA, Trieste, Italy. (6 weeks)	2017

Université de Paris-Sud, Paris, France. (5 weeks)

2017

RECENT CONFERENCE TALKS (2017 - 2019)

University of Edimburgh, UK

Algebra and Representation Theory in the North

2019

Università degli Studi di Pavia, Italy

XXI Congresso dell'Unione Matematica Italiana

(Lie theory section)

2019

Perimeter Institute, Waterloo, Canada

Cohomological Hall algebras in Mathematics and Physics

2019

The University of Auckland, New Zealand

A conference on character varieties and quantisation

2018

CIRM, Luminy, France

VBAC 2018: Gauge Theory and Complex Geometry

(one-hour contributed talk)

2018

University of Glasgow, UK

Geometric Representation Theory

2017

LMPT Tours, France

Quantum groups, Special functions and Integrable systems

2017

Perimeter Institute, Waterloo, Canada

Hitchin Systems in Mathematics and Physics

2017

RECENT SEMINAR TALKS AND COLLOQUIA (2017 - 2020)

2020

The RepNet Virtual Seminar (expected), Università di Roma "Tor Vergata" (Algebra and Representation Theory Seminar), Università degli Studi di Bologna (Algebra and Geometry Seminar), Università di Pisa (Algebraic and Arithmetic Geometry Seminar)

2019

Università degli Studi di Firenze (Seminario di Geometria), University of Sheffield (Algebraic Geometry Seminar), University of York (Algebra Seminar), Kavli IPMU (GTM Seminar), Rutgers University (Geometry, Symmetry and Physics Seminar), Northeastern University (Geometry, Physics, and Representation Theory Seminar), Higher School of Economics, Moscow (Colloquium)

2018

University of Edinburgh (EDGE Seminar), Hong Kong Geometry Colloquium, Université de Strasbourg (Séminaire Quantique), Université de Grenoble (Séminaire de Algèbre et Géométries), Scuola Normale Superiore - Pisa, Università degli Studi di Firenze (Seminario di Geometria), Kavli IPMU (GTM Seminar)

2017

Rutgers University (Geometry, Symmetry and Physics Seminar), MIT (Geometric Representation Theory), SISSA - Trieste (Colloquium), Centre for Quantum Geometry of Moduli Spaces - Aarhus (Aarhus Differential Algebraic Geometry Seminars), Department of Physics and Astronomy - Uppsala University, Institut de Mathématiques de Jussieu and ENS - Paris (Séminaire de Géométrie Algébrique), Institut de Mathématiques de Bourgogne - Dijon (Séminaire de Géométrie et Systèmes Dynamiques), Institut Henri Poincaré - Paris (Séminaire de Géométrie et Quantification), Institut Élie Cartan de Lorraine (Séminaire de Analyse, Géométrie et Algèbre), Kavli IPMU (GTM Seminar)

ORGANIZATIONAL ACTIVITIES

Conferences, Workshops, and Schools:

14. Organizer (with A. Negut, and O. Schiffmann) of the *IHÉS Summer School on Enumerative Geometry, Physics and Representation Theory*
IHÉS, France July 5th - 16th, 2021 (expected)
13. Organizer (with U. Bruzzo and G. Menet) of the workshop on *New Perspectives on Hyperkähler Manifolds. A Celebration of Dimitri Markushevich's 60 Birthday*
Italy June 14th - 18th, 2021 (expected)
12. Organizer (with A. Appel, M. Porta, and O. Schiffmann) of the workshop on *Quantization in Derived Algebraic Geometry and Representation Theory*
BIRS - Casa Matemática Oaxaca, Mexico May 2nd - 7th, 2021 (expected)
11. Organizer (with A. Appel, A. Hochenegger, M. Porta, S. Scherotzke and M. Talpo) of the conference *Ricercatori in Algebra e Geometria 2020*
Scuola Normale Superiore, Italy Postponed due to the COVID-19 pandemic
10. Organizer (with D. Baraglia, P. Hekmati, T. Mochizuki, and M.-H. Saito) of the *Conference on Moduli spaces, Representation theory and Quantization*
RIMS, Kyoto, Japan June 17th - 21st, 2019
9. Organizer (with H. Nakajima, Y. Tachikawa, and Y. Yoshida) of the *Workshop on Representation Theory, Gauge Theory, and Integrable Systems*
Kavli IPMU, Japan February 4th - 8th, 2019
8. Organizer (with U. Bruzzo and A. Grassi) of the *CIME School on Geometric Representation Theory and Gauge Theory*
Cetraro (CS), Italy June 25th - 29th, 2018
7. Organizer (with U. Bruzzo, F. Rodriguez Villegas, and J. Stoppa) of the *School and Workshop on Higgs moduli spaces and character varieties (SWAGP2017)*
SISSA, Trieste, Italy June 19th - 23rd, 2017
6. Organizer (with D. Barilari, F. Fanelli, and A. Lerario) of the *Workshop From students to mathematicians: an excellence Master program in Trieste*
SISSA and Università degli Studi di Trieste, Italy June 14th - 16th, 2017
5. Organizer (with J. Kamnitzer and O. Schiffmann) of the *Workshop on Hall algebras, enumerative invariants and gauge theories*
Fields Institute, Toronto, Canada November 14th - 18th, 2016
4. Organizer (with U. Bruzzo, E.-D. Diaconescu, F. Perroni, and C. Bai) of the *Workshop on Moduli Spaces in Algebraic Geometry and Mathematical Physics*
Chern Institute of Mathematics, Tianjin, China September 14th - 18th, 2015
3. Organizer (with M. Jardim, F. Perroni, et al.) of the *Workshop on Interactions between Geometry and Physics, a conference in honor of Ugo Bruzzo's 60th birthday*
Guarujá, São Paulo, Brazil August 17th - 21st, 2015
2. Organizer (with U. Bruzzo, D. Markushevich, V. Rubtsov, and S. Shadrin) of the *Workshop on Instanton Counting: Moduli Spaces, Representation Theory and Integrable Systems*
Lorentz Center, Leiden, The Netherlands June 16th - 20th, 2014
1. Organizer (with U. Bruzzo, et al.) of the *VBAC2013 (2013 meeting of the Vector Bundles on Algebraic Curves Group) Hilbert Schemes, Sheaves and Representation Theory*
SISSA, Trieste, Italy June 17th - 21st, 2013
- Departmental Seminars:**
3. Organizer of the *Seminar on Combinatorics, Lie Theory, and Topology*
Università di Pisa, Italy 2020 - present
2. Member of the Steering Committee of *Geometric Representation Theory at Home*
Online Seminar 2020 - present
1. Organizer (with R. Jardine) of the *Geometry and Topology Seminar*

University of Western Ontario, Canada

2015 - 2016

GRANTS

Università di Pisa

Grants

- Progetto di Ricerca di Ateneo (no. PRA_2020_40) "Spazi di moduli, geometria aritmetica e aspetti storici" (together with A. Bandini, A. Cogliati, V. Melani, T. Szamuely, M. Talpo) (€ 31,625)
- Fondi di Ateneo 2020 (€ 2,100)

Japanese Society for the Promotion of Science (JSPS)

Grants-in-Aid for Scientific Research (KAKENHI)

- Grant-in-Aid for Young Scientists. Cohomological Hall algebra of a curve (no. JP18K13402). 2018 - 2020 (PI, ¥ 2,860,000)
- Grant-in-Aid for Research Activity Start-up. Hall algebras and gauge theory on a surface (no. JP17H06598). 2017 - 2019 (PI, ¥ 1,300,000)

Foundation Compositio Mathematica

Conference Grant

- *New Perspectives on Hyperkähler Manifolds. A Celebration of Dimitri Markushevich's 60 Birthday*, Levico Terme, Italy. 2020
- *CIME School on Geometric Representation Theory and Gauge Theory*, Cetraro, Italy. 2018
- *Workshop on Hall algebras, enumerative invariants and gauge theories*, Fields Institute, Toronto, Canada. 2016
- *Workshop on Moduli spaces in Algebraic Geometry and Mathematical Physics*, Chern Institute of Mathematics, Tianjin, China. 2015

RECENT TEACHING EXPERIENCE (2014 - 2021)

Instructor. Università di Pisa, Italy

2020 - present

- Yangians in geometry and representation theory (Graduate course, PhD in Mathematics). Winter 2021
- Analisi Matematica 1 (Laurea Triennale in Ingegneria Biomedica). Fall 2020
- Geometria 2 (Laurea Triennale in Matematica). Winter 2020

Instructor. University of Western Ontario, Canada

2014 - 2016

- Math 1228 B: Methods of Finite Mathematics. Winter 2016
- Math 1229 A: Methods in Matrix Algebra. Fall 2015
- Calculus 1301 B: Calculus II. Winter 2015
- Math 1229 A: Methods in Matrix Algebra. Fall 2014

GRADUATE STUDENT

Mattia Pedrini (PhD, SISSA, Italy, with U. Bruzzo)

2010 - 2013

OTHER ACADEMIC ACTIVITIES

Referee for Adv. Math., Bull. Sci. Math., Comm. Math. Phys., Épijournal Geom. Algébrique, Int. Math. Res. Not. IMRN, J. Algebra, J. Algebraic Geom., J. Geom. Phys., J. Pure Appl. Algebra, Lett. Math. Phys., Proc. Edinburgh Math. Soc, Sel. Math. New Ser., Mosc. Math. J., SIGMA, Tunis. J. Math.

Committee Member:

Young Scientist Award, supported by Elsevier Publishing House. June 2017

Young Scientist Award, supported by Elsevier Publishing House, in honor of U. Bruzzo's 60th anniversary. September 2015

University and Departmental Services:

- University of Western Ontario, Canada October 2014 - June 2015
International Postdoctoral Representative at the Postdoctoral Association at Western
- SISSA, Trieste, Italy December 2008 - October 2011
Students' Representative at the Mathematical Physics Sector
- Università degli Studi di Trieste, Italy October 2006 - October 2008
Students' Representative at the Dipartimento di Matematica

Member of

- GNSAGA-INdAM
- research project PRIN *Geometria delle Varietà Algebriche*, co-funded by MIUR (cofin 2010). February 2013 - February 2016
- research project PRIN *Problemi di classificazione e moduli in geometria algebrica*, co-funded by MIUR (cofin 2008). March 2010 - September 2012

LANGUAGES

Italian: Mother tongue. **English:** Fluent knowledge. **French:** Fluent knowledge. **Spanish:** Fair knowledge.

Updated on April 29th, 2020