Annalisa Grossi

Curriculum Vitae

P.zza di Porta San Donato 5
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Personal informations

Nationality Italian

Research interests Irreducible holomorphic symplectic manifolds and varieties, in particular automorphisms and birational transformations on O'Grady's deformation type manifolds, moduli spaces of sheaves on K3 surfaces and on abelian surfaces in the singular and in the smooth case.

Employment

05.2024 – **Post-doc position**, Università degli studi di Bologna, Department of Mathematics, P.zza di Porta San Donato 5, 40126 Bologna (Italy).

Mentor: Prof. Giovanni Mongardi.

04.2023 – 04.2024 **Postdoctoral fellow, ERC Synergy Grant 854361 "HyperK"** , Université Paris-Saclay, Laboratoire de mathématiques d'Orsay, Rue Michel Magat, Bât. 307, 91405 Orsay, France.

Mentor: Prof. Emanuele Macrì.

10.2020 – 03.2023 **Post-doc position**, Technische Universität Chemnitz, Fakultät für Mathematik, Reichenhainer Straße 39, 09111 Chemnitz, Germany.

Mentor: Prof. Christian Lehn.

10.2019 – 9.2020 **Post-doc position**, Universität Augsburg, Fakultät für Mathematik, Universitätstraße 2, 86159 Augsburg, Germany.

Mentor: Prof. Marc Nieper–Wißkirchen.

Education

10.2016 – 9.2019 **Ph.D. in Mathematics**, Università degli studi di Bologna, Department of Mathematics, P.zza di Porta San Donato 5, 40126 Bologna (Italy).

Thesis: Automorphisms of O'Grady's sixfolds.

Advisor: Prof. Giovanni Mongardi.

Final defence: 03.04.2020.

10.2014 – 9.2016 **Master degree in Mathematics**, Università degli studi di Bologna, Department of Mathematics, P.zza di Porta San Donato, 40126 Bologna (Italy).

Thesis: Varietà toriche e politopi convessi.

Advisor: Prof. Luca Migliorini.

Final defence: 23.09.2016.

Final mark: 110/110 cum laude.

9.2011 – 9.2014 **Bachelor degree in Mathematics**, Università degli studi di Bologna, Department of Mathematics, P.zza di Porta San Donato, 40126 Bologna (Italy).

Thesis: Un'applicazione della teoria di Morse alla topologia delle varietà di Stein.

Advisor: Prof. Luca Migliorini.

Final defence: 24.10.2014.

Final mark: 110/110 cum laude.

2011 **Diploma di maturità scientifica, (indirizzo PNI)**, Liceo scientifico Alessandro Serpieri, Rimini (Italy).

Final mark: 100/100 cum laude.

Publications

1. D. Al Tabbaa, A. Grossi, A. Sarti. *Symmetries of order eight on K3 surfaces without high genus curves in the fixed locus.* Geometry at the Frontier, Contemporary Mathematics, **766**, Amer. Math. Soc., Providence, RI, (2021), 17-30. doi.org/10.1090/conm/766/15370

2. A. Grossi. *Induced birational transformations on O'Grady's sixfolds.* Journal of The London Mathematical Society, **105** (2022), no. 1, 665-690. doi.org/10.1112/jlms.12538

3. A. Grossi, C. Onorati, D.C. Veniani. *Symplectic birational transformations of finite order on O'Grady's sixfolds.* Kyoto Journal of Mathematics, **63** (2023), no. 3, pp. 615–639 ,doi 10.1215/21562261-10577928.

4. A. Grossi. *Nonsymplectic automorphisms of prime order on O'Grady's sixfolds.* Revista Matemática Iberoamericana **38** (2022), no. 4, pp. 1199–1218, doi.org/10.4171/RMI/1341 https://arxiv.org/pdf/2004.12694.pdf.

5. V. Bertini, A. Grossi. *Rational curves on primitive symplectic varieties of OG6 singular type.* Math. Z. **304** (2023), no. 36, https://doi.org/10.1007/s00209-023-03296-5

6. L. Giovenzana, A. Grossi, C. Onorati, D.C. Veniani. *Symplectic rigidity of O'Grady's tenfolds.* Proceedings of AMS. In press (2023) https://doi.org/10.1090/proc/16810

7. C. Felisetti, F. Giovenzana, A. Grossi. *O'Grady tenfolds as moduli spaces of sheaves.* Forum of Mathematics, Sigma, **12** e:60 (2024) pp. 1–20 https://doi.org/10.1017/fms.2024.46

Preprints

1. V. Bertini, A. Grossi, M. Mauri, E. Mazzon. *Terminalizations of quotients of compact hyperkähler manifolds by induced symplectic automorphisms.* Sumbmitted (2024) https://arxiv.org/pdf/2401.13632.pdf

2. E. Brakkee, C. Camere, A. Grossi, G. Saccà, L. Pertusi and A. Viktorova. *Irreducible symplectic varieties via relative Prym varieties.* Submitted (2024) https://arxiv.org/pdf/2404.03157.pdf

3. S. Billi, A. Grossi. *Non-symplectic automorphisms of prime order of O'Grady's tenfolds and cubic fourfolds.* Submitted (2024) https://arxiv.org/abs/2405.05932

Thesis

Ph.D. thesis – 2020   Automorphisms of O'Grady's sixfolds, http://amsdottorato.unibo.it/9441/.

M.D. thesis – 2016   Varietà toriche e politopi convessi. *Available upon request.*

Papers in preparation

1. Singular Fano varieties of K3 type. *With V. Bertini, F. Denisi and E. Fatighenti.*

2. Towards a classification of Enriques manifolds. *With S. Billi, F. Giovenzana and L. Giovenzana.*

3. Cubic fourfolds with a symplectic automorphisms of prime order. *With S. Billi, L. Marquand.*

4. An irreducible symplectic variety with big second Betti number. *With P. Beri, A.D. Ríos Ortiz.*

5. Regenerations techniques for rationality problems on O'Grady's manifolds. *With V. Bertini.*

Visiting Periods

11.2023 (2 weeks)   Visiting researcher at the HIM Bonn - Trimester program 'Algebraic geometry: derived categories, Hodge theory, and Chow groups'.

04.2022 (1 week)   Visiting researcher the Faculty of Mathematics of Università degli Studi di Milano.

02.2022   Guest of the Faculty of Mathematics of Université de Lille.

11.2019   Guest of the Faculty of Mathematics of TU Chemnitz (Germany), supervised by Prof. Christian Lehn.

5.2019   Guest of the Université de Poitiers (France), supervised by Prof. Alessandra Sarti.

4.2018 – 5.2018 Guest of the Massachusetts Institute of Technolology (M.I.T.) in Boston, MA, supervised by Prof. Giulia Saccà.

Funding and Awards

2019 Awarded a competitive funding from LYSM, for a visiting period at Universite de Poitiers (France).

2016 – 2019 Obtained additional funding for research activities from INDAM during the course of Phd study activity in Italy.

2018 Awarded a competitive funding from G.H.A.I.A. Project, a European project for research activity in U.S., for a visiting period at Massachusetts Institute of Technology (M.I.T.) in Boston, MA.

Teaching activity

09.2024 - 12.2024 **Lecturer of the course: Geometria e Algebra (60 ore)**
Università degli studi di Bologna, Dipartimento di Ingegneria civile, Italy.

05.2024 - 06.2024 **Lecturer of the Ph.D. course: "Automorphisms of Hyperkähler manifolds" (12 ore)**
Università degli studi di Bologna, Dipartimento di Matematica, Italy.

10.2021 - 02.2022 **Teaching assistant for the course Perverse Sheaves (30 hours)**
Technische Universität Chemnitz, Fakultät für Mathematik, Germany.

04.2021 - 07.2021 **Teaching assistant for the course Complex Geometry (30 hours)**
Technische Universität Chemnitz, Fakultät für Mathematik, Germany.

10.2020 - 02.2021 **Teaching assistant for the course Representation Theory (30 hours)**
Technische Universität Chemnitz, Fakultät für Mathematik, Germany.

10.2020 - 02.2021 **Lecturer for the course Commutative Algebra (30 hours)**
Technische Universität Chemnitz, Fakultät für Mathematik, Germany.

04.2020 - 07.2020 **Teaching assistant for the course Computer Algebra (30 hours)**
Universität Augsburg, Fakultät für Mathematik, Germany.

10.2019 - 02.2020 **Teaching assistant for the course Algebra (20 hours)**
Universität Augsburg, Fakultät für Mathematik, Germany.

2018 - 2019 **Teaching assistant for the course Matematica con esercitazioni (30 hours)**
2017 - 2018 Università degli studi di Bologna (sede di Rimini), Dipartimento di Chimica
2016 - 2017 e Tecnologie per l'ambiente e per i materiali, Italy.

2018 - 2019	**Teaching assistant for the course Algebra e Geometria (30 hours)**
2017 - 2018	Università degli studi di Bologna, Department of Physics, Italy.
2016 - 2017	
2015 - 2016	**Teaching assistant for the course Geometria 1 (30 hours)**
	Università degli studi di Bologna, Department of Mathematics, Italy.

Invited talks

September, 2024	Invited speaker at the workshop:"Ricercatori in Algebra e Geometria 2024", University of Milan, Italy.
September, 2024	Invited speaker at the conference:"Japanese-European symposium on symplectic varieties and moduli spaces", University of Kyoto, Japan.
May, 2024	Invited speaker at "mini-workshop on generalized Kummer varieties": University of Kraków , Poland.
May, 2024	Invited talk at Toulouse University.
May, 2024	Invited talk at Università di Genova.
February 29, 2024	Invited talk at UNIMORE.
March, 2024	Invited talk at Politecnico di Milano.
February 29, 2024	Invited talk at Strasbourg University.
January 10-11, 2024	Invited talk at Dijon University.
January 22-26, 2024	Invited speaker at the conference "Fano and Hyperkähler varieties in Genova".
December 12-14, 2023	Invited talk at Saarbrücken University.
December 6-7, 2023	Invited speaker at the conference "New perspecitves on Enriques surfaces" at University of Turin.
September 11-15, 2023	Conference "Giornate di Geometria Algebrica ed Argomenti Correlati", Hotel San Michele Cetraro,Italy.
September 1-8, 2023	Conference "Geometry of Hyperkähler varieties", Institute for Advanced Study in Mathematics (IASM-Hangzhou), China.
July 13, 2023	*"Irreducible symplectic varieties via Prym fibrations"*, Groupe de Travail en Géométrie Algébrique at the University of Poitiers, France.
May 22-26, 2023	Conference:"Japanese-European symposium on symplectic varieties and moduli spaces", Università degli studi di Milano, Italy.

May 12, 2023	Algebraic geometry seminar at Università degli Studi di Bologna.
April 9-14, 2023	Komplexe Analysis — Differential and Algebraic methods in Kähler spaces. Oberwolfach, Germany.
January 29-February 3, 2023	Workshop: "Hyperkahler quotients, singularities, and quivers", Simons Center, Stony Brook, US.
June 13-17, 2022	Conference "New Perspectives on Hyperkähler Manifolds - A Celebration of Dimitri Markushevich's (60+2)nd Birthday", Bellavista Relax Hotel, Levico Terme, Italy.
April 27-28, 2022	Workshop "Grothendieck ring and Derived category: a gathering", Università degli studi di Torino, Italy.
April 4-8, 2022	Conference "Symplectic Singularities in geometry and representation theory", CIRM, Marseille-Luminy, France.
March 14-18, 2022	Conference "Japanese - European symposium on symplectic varieties and moduli spaces", Bologna, Italy.
February 1, 2022	Algebraic geometry seminar, University of Lille, France.
December 13-17, 2022	*"Ihs varieties as symplectic quotients of ihs manifolds"*, Conference "Geometry and Arithmetic of varieties with trivial canonical bundle", Oslo, Norway.
November 11-12, 2021	*"Ihs varieties as symplectic quotients of ihs manifolds"*, Mini-workshop about Singular Irreducible Symplectic Varieties, Università di Milano, Italy.
October 7, 2021	*"Induced nonsymplectic automorphisms on manifolds of OG_6 type"*, Iskovskikh Seminar, HSE-Moscow, Russia.
July 5-9, 2021	*"Automorphisms of irreducible holomorphic symplectic manifolds of OG_6 type"*, Conference GAeL XXVIII, Loughborough, UK.
June 9, 2021	*"Symplectic actions on irreducible holomorphic symplectic manifolds of OG_6 type"*, "A one-day workshop on K3 surfaces and hyperkähler manifolds", University of Milan, Italy.
February 5, 2021	*"Symplectic actions on irreducible holomorphic symplectic manifolds of OG_6 type"*, Algebraic geometry seminar, University of Trento, Italy.
July 2, 2020	*"Automorphisms of irreducible holomorphic symplectic manifolds of OG_6 type"*, ZOOMerFEST: Young Algebraic Geometers seminars, HSE-Moscow, Russia.
January 22-24, 2020	*"Induced automorphisms on O'Grady's sixfodls"*, "Workshop Exarchos on IHS manifolds", University of Bologna, Ravenna, Italy.

January 10, 2020	"Automorphisms on O'Grady's sixfolds", Oberseminar "Algebra und Zahlentheorie" at Universität Augsburg, Germany.
November 25, 2019	*"Induced automorphisms on O'Grady's sixfolds"*,Oberseminar "Algebra und Theoretische Mathematik" at TU-Chemnitz, Germany.
May 14, 2019	*"Automorphisms on O'Grady's sixfolds"*,"Groupe de Travail en Géométrie Algébrique" at the University of Poitiers, France.
June 2018	*"First results about automorphisms of O'Grady six-dimensional manifold"*, JAWS at University of Warwick, UK.
November 2017	*"Morse theory"*, "B.a.d. seminar", University of Bologna, Italy.

Workshop and seminars organized

June 2023	Member of the organizing committee of the 2 days workshop "Kummer in Paris" University of Paris-Saclay, Orsay, France.
February 2023	Member of the organizing committee of the workshop "Young perspectives on IHS manifolds" University of Stuttgart, Germany.
January 29-31 2019	Member of the organizing committee of "Workshop on Fano and IHS manifolds", held at Università degli studi di Bologna, Italy.
November 23-24 2017	Member of the organizing committee of "Workshop on IHS manifolds and stability conditions" held at Università degli Studi di Bologna, Italy.

Working seminars

05.2022-07.2022	Joint working seminar at Chemnitz University about "Logarithmic deformation theory of normal crossing varieties and smoothability".
10.2021-01.2022	Member of the organizing committee of the joint working seminar among University of Bologna, Chemnitz and Nancy about "Bridgeland stability conditions".
03.2021-05.2021	Joint working seminar at Chemnitz University about "Berkovich skeleta and birational geometry".

Referee

Referee for Algebra & Number Theory, Mathematische Zeitschrift, Forum Math Sigma.

Reviewer for Zentralblatt-math, Mathematical Reviews.

Conferences, workshop and school attended (selection)

September 12-15, 2023	Giornate di Geometria Algebrica ed Argomenti Correlati 2023, Cetraro, Italia.
September 4-8, 2023	Workshop: Geometry of Hyperkähler varieties, Hangzhou, China.

June 14-15, 2023	Meeting Erc Hyperkähler in Paris, Paris.
May 31, June 02, 2023	Moduli in Nantes, Nantes, France.
May 22-26, 2023	Conference:"Japanese-European symposium on symplectic varieties and moduli spaces", Università degli studi di Milano, Italy.
April 2023	Komplexe Analysis — Differential and Algebraic methods in Kähler spaces. Oberwolfach, Germany.
February 27–March 3, 2023	Banff Workshop "Around symmetries of K3 surfaces", Canada. Online.
January, 2023	Workshop: "Hyperkahler quotients, singularities, and quivers", Simons Center, Stony Brook, US.
September 19–23, 2022	Summer school "Recent perspectives on Hodge Theory", Centro De Giorgi, Pisa.
September 12–16, 2022	Conference, "Hyperkähler varieties and related topics", Sapienza Università Roma.
August 28– September 3, 2022	Conference: "Hyperkähler manifolds and related geometries", Cetraro, Italy.
June 30, July 1st, 2022	Workshop "Derived categories and birational geometry", University of Milan, Italy.
June 12-17, 2022	"New Perspectives on Hyperkähler Manifolds. A Celebration of Dimitri Markushevich's 60th Birthday", Bellavista Relax Hotel, Levico Terme, Italy.
June 5-10, 2022	School "Moduli spaces and stability conditions", Bellavista Relax Hotel, Levico Terme, Italy.
April 27-28, 2022	"Grothendieck ring and derived category: a gathering", Unversità di Torino, Italy.
April 4-8, 2022	"Symplectic Singularities in geometry and representation theory", CIRM, Marseille-Luminy, France.
March 14-18, 2022	"Japanese - European symposium on symplectic varieties and moduli spaces", Università degli Studi di Bologna, Italy.
December 14-16 2021	*"Arithmetic and geometry of varieties with trivial canonical bundle"*, Oslo, Norway.
November 11-12 2021	*Mini-workshop "Singular irreducible symplectic varieties"*, University of Milan, Italy.

September 13-14 2021	*Workshop "Moduli spaces and hyperkähler varieties in Rome"*, Università La Sapienza, Rome, Italy.
September 6-10 2021	*Workshop "Hyperkähler geometry"*, University of Bonn, Germany.
June 9 2021	*A one day workshop: "K3 surfaces and hyperkähler manifolds"*, University of Milan, Italy.
March 19 2021	*Online Workshop Birational Geometry and Thereabouts,*University of Palermo, Italy.
July 27-31 2020	*Online Workshop WiAG (Women in Algebraic Geometry*, ICERM (Brown University), Providence, Rhode Island.
January 22-24 2020	*"Workshop Exarchos"*, Università degli Studi di Bologna, Italy.
December 19-20 2019	*"Geometry in Pairs"*, Università degli studi Roma Tre, Roma, Italy.
June 24-28 2019	*"Workshop on derived categories, moduli spaces and deformation theory"*, Cetraro, Italy.
June 3-7 2019	*"Japanese-European symposium on symplectic varieties and moduli spaces"*, ETH Institute, Zürich, Switzerland.
February 18-22 2019	*"Entire curves, rational curves and foliations"*, CIRM, Luminy, Marseille, France.
December 20-21 2018	*"Aeneas Conference: Migrating Algebraic Geometry"* Università degli studi Roma Tre.
November 4-7 2018	*"Chow Lectures: by Peter Scholze"*, at Max-Planck-Institut für Mathematik", Leipzig, Germany.
August 27-31 2018	*"Japanese - European symposium on symplectic varieties and moduli spaces"*, Kagurazaka (Tokyo), Japan.
June 18-22 2018	*"GAeL" (Geometrie Algebrique en Liberte)*, University of Strasbourg, France.
March 19-23 2018	*"School on birational geometry of hypersurfaces"*, Palazzo Feltrinelli, Gargnano del Garda, Italy.
February 19-23 2018	*"Winter school in Geometry, Algebra and Combinatorics of Moduli Spaces"*, Dobbiaco, Italy.
September 18-22 2017	*"Japanese-European symposium on symplectic varieties and moduli spaces"*, Levico, Italy.
July 5-8 2017	*"School on deformation theory"*, Università di Torino, Italy.

June 26-30 2017	*"GAeL" (Geometrie Algebrique en Liberte)*, University of Bath, UK.
June 5-9 2017	*"Linear systems on irregular varieties"*, Como, Italy.
February 19-25 2017	*"Winter school in Geometry, Algebra and Combinatorics of Moduli spaces"*, Dobbiaco, Italy.
July 22-25 2015	*"Summer School on computational topology"*, ACAT (Applied and Computational Algebraic Topology), Lubiana, Slovenia.

Hiring committee

February 2021	Member of the Hiring Committee of PhD students in Algebraic Geometry at TU-Chemnitz.

Other personal skills

July 2021	Habilitation to the teaching class of competition A/026 (Mathematics at High School) in July 2021.

Programming language

Python, Sage.

Language

Mother tongue	Italian.
Other language(s)	English, fluent, C1.
	German, early intermediate, A2.

References

Christian Lehn	Ruhr-Universität Bochum, christian.lehn@rub.de
Emanuele Macrì	Université Paris-Saclay, emanuele.macri@universite-paris-saclay.fr
Giovanni Mongardi	Università degli Studi di Bologna, giovanni.mongardi2@unibo.it
Alessandra Sarti	Université de Poitiers, Alessandra.Sarti@math.univ-poitiers.fr