



First Name: Giovanni
Surname: Cerulli Irelli
Citizenship: Italian
Office Address: Dipartimento di Matematica,
Sapienza-Università di Roma
Piazzale Aldo Moro 5, 00185 Roma (ITALY)
Office Phone Number: +39 06 49 69 42 30
Personal Phone Number: +39 340 81 39 747
E-Mail Addresses: cerulli@mat.uniroma1.it,
cerulli.math@googlemail.com
Residence Address: Via Salaria 280, 00199, Roma (ITALY)
Languages: Italian (Native), English (Fluent), French (Beginner)

GIOVANNI CERULLI IRELLI
CURRICULUM VITAE

EDUCATION

- 2005–2007 : Phd in mathematics at Università degli studi di Padova.
External advisor Andrei Zelevinsky (Northeastern University, Boston (MA))
Internal advisor Alberto Tonolo
Title of the phd–thesis: *Structural theory of rank three cluster algebras of affine type.*
Date of defence: April 29, 2008.
Committee: Bernhard Keller (Paris VII), Silvana Bazzoni (Padova), Paolo Papi (Roma “La Sapienza”).
- September 29, 2004: “Laurea in matematica con lode” (master degree in mathematics with full marks) at Università degli studi di Roma “La Sapienza”, Rome (ITALY)
Title of the master thesis: *Su una congettura di Zamolodchikov*
Supervisors: Paolo Papi, Corrado De Concini.
- 1995–2000: Student at Liceo classico T. Tasso, via Sicilia, 00187, Rome.

RESEARCH

My research interests are in:

1. Representation theory of finite dimensional algebras;
2. Cluster algebras and related topics, in particular their categorifications;
3. Quivers, quivers with potentials;
4. Geometry of quiver Grassmannians.

Post-docs:

- 1 February 2014–1 March 2016: post–doc n. 8/2013 at the Department of Mathematics of “Sapienza Università di Roma”, Rome (ITALY). Title of the research statement: “Prospettive in teoria di Lie”. Supervisor: Prof. Alberto De Sole.
- 1 March 2013–31 January 2014: Principal Investigator for the priority program SPP 1388 financed by DFG (German Research Foundation). To be held at Mathematical Institute of the University of Bonn, Bonn (GERMANY)
- 15 August 2011– 28 February 2013: post–doc at Mathematical Institute of the University of Bonn, Bonn (GERMANY). Supervisor: Prof. Jan Schröer.
- 3 January 2011–30 April 2011: guest researcher at Hausdorff Research Institute for Mathematics, Bonn (GERMANY).
- March 2010–February 2011: post–doc at the Department of Mathematics of “Sapienza Università di Roma”, Rome (ITALY). Supervisor: Prof. Corrado De Concini.
- April 2008–February 2010: post–doc at the Department of Mathematics of “Università degli studi di Padova”, Padova (ITALY). Supervisor: Prof. Alberto Facchini.

BIBLIOMETRIC DATA

1. h-index: 5
2. Number of citations: 66.
3. Number of publications: 13.
4. Year of the first publication: 2011.

OTHER TITLES

1. Qualified for the "Abilitazione Scientifica Nazionale- 01/A2" (2013) to work as Associated Professor in Algebra and Geometry at an Italian university.
2. Qualified for the audition of the grant S.I.R. financed by MIUR, with evaluation 30/30. Year: 2015.
3. Qualified to get an "INdAM-COFUND Fellowship in Mathematics and/or Applications for experienced researchers cofounded by Marie Curie actions". Year: 2011.

PUBLICATIONS

1. "Schubert Quiver Grassmannians".
G. Cerulli Irelli, E. Feigin, M. Reineke.
To appear in *Algebras and Representation Theory*. (2016).
2. "Degenerate flag varieties of type A and C are Schubert varieties".
G. Cerulli Irelli, M. Lanini.
International Mathematics Research Notices. (2014).
arXiv: <http://arxiv.org/abs/1403.2889>.
3. "Homological approach to the Hernandez–Leclerc construction and quiver varieties".
G. Cerulli Irelli, E. Feigin and M. Reineke.
Representation Theory of the American Mathematical Society. **18** (2014), 1–14.
<http://www.ams.org/journals/ert/2014-18-01/S1088-4165-2014-00449-7/>
arXiv: <http://arxiv.org/abs/1302.5297>.
4. "Desingularization of quiver Grassmannians associated with Dynkin quivers".
G. Cerulli Irelli, E. Feigin, M. Reineke.
Advances in Mathematics. **245** (2013), 182–207.
<http://www.sciencedirect.com/science/article/pii/S0001870813002119#>
arXiv: <http://arxiv.org/abs/1209.3960>.
5. "Caldero–Chapoton algebras".
G. Cerulli Irelli, D. Labardini Fragoso, J. Schröer.
Transactions of the American Mathematical Society. **367** (2015), 2787–2822.
<http://www.ams.org/journals/tran/2015-367-04/S0002-9947-2014-06175-8/>
arXiv: <http://arxiv.org/abs/1208.3310>
6. "Degenerate flag varieties: moment graphs and Schröder numbers".
G. Cerulli Irelli, E. Feigin, M. Reineke.
Journal of Algebraic Combinatorics. **38** (2013), no. 1, 159–189.
<http://link.springer.com/article/10.1007/s10801-012-0397-6#>
arXiv: <http://arxiv.org/abs/1206.4178>
7. "Linear independence of cluster monomials for skew–symmetric cluster algebras".
G. Cerulli Irelli, B. Keller, D. Labardini Fragoso, P.-G. Plamondon.
Compositio Mathematica. **149** (2013), 1753–1764.
[dx.doi.org/10.1112/S0010437X1300732X](https://doi.org/10.1112/S0010437X1300732X)
arXiv: <http://arxiv.org/abs/1203.1307>

8. “Quivers with potentials associated to triangulated surfaces, Part III: tagged triangulations and cluster monomials”.
G. Cerulli Irelli, D. Labardini Fragoso.
Compositio Mathematica. **148** (2012), 1833–1866.
http://journals.cambridge.org/abstract_S0010437X12000528
arXiv: <http://arxiv.org/abs/1108.1774>
9. “Quiver Grassmannians and degenerate flag varieties”.
G. Cerulli Irelli, E. Feigin, M. Reineke.
Algebra and Number Theory. **6** (2012), no. 1, 165–194.
<http://msp.org/ant/2012/6-1/p05.xhtml>
arXiv: <http://arxiv.org/abs/1106.2399>
10. “Quiver Grassmannians associated with string modules”.
G. Cerulli Irelli.
Journal of Algebraic Combinatorics. **33** (2011), 259–276.
<http://dx.doi.org/10.1007/s10801-010-0244-6>
arXiv: <http://arxiv.org/abs/0910.2592>
11. “Geometry of quiver Grassmannians of Kronecker type and applications to cluster algebras”.
G. Cerulli Irelli, F. Esposito.
Algebra and Number Theory. **5** (2011), no. 6, 777–801.
<http://msp.org/ant/2011/5-6/p02.xhtml>
arXiv: <http://arxiv.org/abs/1003.3037>
12. “Cluster algebras of type $A_2^{(1)}$ ”.
Algebras and Representation Theory. **15** (2012), no. 5, 977–1021.
<http://www.springerlink.com/content/67714h0252207362/>
arXiv: <http://arxiv.org/abs/0904.2543>
13. “A homological interpretation of transverse quiver Grassmannians”.
G. Cerulli Irelli, G. Dupont, F. Esposito.
Algebras and Representation Theory. **16** (2013), no. 2, 437–444.
<http://dx.doi.org/10.1007/s10468-011-9314-2>
arXiv: <http://arxiv.org/abs/1005.1405>
14. Ph.D. thesis: “Structural theory of rank three cluster algebras of affine type”.
G. Cerulli Irelli
Università di padova
<http://paduaresearch.cab.unipd.it/734/>

PREPRINTS

1. “Geometry of quiver Grassmannians of Dynkin type with applications to cluster algebras”.
G. Cerulli Irelli (2016)
arXiv: <http://arxiv.org/abs/1602.03039>
2. “Degenerate flag varieties and Schubert varieties: a characteristic-free approach”.
G. Cerulli Irelli, M. Lanini, P. Littelmann (2015)
arXiv: <http://arxiv.org/abs/1502.04590>
3. “Positivity in skew-symmetric cluster algebras of finite type”.
G. Cerulli Irelli (2011)
arXiv: <http://arxiv.org/abs/1102.3050>

In Preparation

1. “Universal Degenerate Flag varieties of Type A”
G. Cerulli Irelli, E. Feigin, G. Fourier, M. Reineke, X. Fang.
2. “Isotropic Quiver Grassmannians”
G. Cerulli Irelli.

3. “Positivstellensatz for Cluster Algebras of Geometric Type”
G. Cerulli Irelli, A. D’Andrea.
4. “A quiver Approach to the study of \mathbf{Z}_2 -invariants of Topological Insulators”
G. Cerulli Irelli, D. Fiorenza, G. Panati.

INTERNATIONAL CONFERENCES AND SCHOOLS:

- August 29– September 2, 2016: invited speaker at the CIRM conference “Algebraic combinatorics in Representation Theory”, Luminy (FRANCE).
- February 28– March 5, 2016: participant at the Oberwolfach Workshop “PBW Structures in Representation Theory”, Oberwolfach (GERMANY).
- November 6–8, 2015: Invited speaker at the annual conference “ARTIN 46”. Glasgow (UK).
- March 9–13, 2015: Invited speaker at “DFG- SPP1388 Annual Meeting”. Physikzentrum Bad Honnef (GERMANY).
- January 19– February 6, 2015: “Lie Theory and Representation Theory”. Centro De Giorgi. Pisa (ITALY).
- January 7–10, 2015: “Aspects of Lie Theory”. INDAM, Roma (ITALY)
- August 20– 29, 2014: participant at “ICRA XVI: International Conference on Representations of Algebras and Workshop”. Sanya, CHINA.
- June 16–20, 2014: participant at “Algebraic Structures and Their Applications” with a day dedicated to Alberto Facchini on the occasion of his 60th birthday. Abbazia di Spineto, Siena (ITALY)
- March 24–27, 2014: participant at “DFG-SPP1388 Annual Meeting 2014”. Soltau (GERMANY).
- December 8–14, 2013: Oberwolfach meeting “Cluster Algebras and related topics”. Organizers: Jan Schröer, B. Keller, B. Leclerc. MFO. Oberwolfach (GERMANY)
- November 23–25, 2013: invited speaker at ”Conference on Geometric Methods in Representation Theory”. University of Missouri–Columbia. Department of Mathematics.
- September 30– October 4, 2013: participant at ”Groupes, Combinatoire, algèbres non–associatives”. C.I.R.M. Luminy (FRANCE).
- September 9– 13, 2013: participant at ”A.R.T.A. 2013: Advances in Representation Theory of Algebras”. University Nicolaus Copernicus. Toruń (POLAND).
- April 24– 28, 2013: participant at ”Algebra, Combinatorics and Representation Theory”: in memory of Andrei Zelevinsky. Northeastern University. Boston (MA), USA.
- April 18– 23, 2013: participant at “Maurice Auslander Distinguished Conference” with the contribution of a talk. Woods Hole (MA), USA.
- March 25–28, 2013: participant at “DFG-SPP1388 Annual Meeting 2013”. Bad Boll (GERMANY).
- March 18– 22, 2013: participant at the workshop on ”Triangulations and Mutations”. Newcastle, GB.
- August 8– 17, 2012: participant at ICRA XV with the contribution of a talk in a parallel session. Bielefeld, GERMANY.
- April 25– 30, 2012: participant at Maurice Auslander Distinguished Conference with the contribution of a talk. Woods Hole (MA), USA.
- June 15–July 15, 2011: visitor at the Department of Mathematics of the University of Padua. Padova, ITALY.
- May 15–June 4, 2011: visitor at the Department of Mathematics of the ”Higher School of Economics”. Moscow, RUSSIA.
- January 3–April 29, 2011: participant at HIM Trimester Program: *On the Interaction of Representation Theory with Geometry and Combinatorics*. Bonn, GERMANY.

- December 5–24, 2010: visitors in Taiwan. Participant at *Taipei winter school in representation theory* (16–19 Dec.); participant at *Taipei conference on representation theory* (20–23 Dec). Academia Sinica, Taipei, TAIWAN.
- August 6–15, 2010: participant at *ICRA XIV: XIV International Conference on Representations of Algebras and workshop*. Tokyo, JAPAN.
- April 22–27, 2010: participant at *Maurice Auslander distinguished lectures and international conference*. Woods Hole (MA), USA.
- January 18–February 5, 2010: participant at *Advanced School and Conference on Homological and Geometrical Methods in Representation Theory*. Trieste, ITALY.
- August 9–August 15, 2009: participant at *Homological and geometric methods in algebra*. Trondheim, NORWAY.
- July 26–August 1, 2009: participant at *Summer school on geometry of representations*. Cologne, GERMANY.
- June 15–July 15, 2009: participant at *Felix Klein lectures 2009: “Cluster Algebras, cluster categories and periodicity”*. Bonn, GERMANY.
- April 22–28, 2009: participant at *Maurice Auslander distinguished lectures and international conference*; Northeastern University, Mathematics department. Woods Hole (MA), USA.
- March 2–6, 2009: participant at *Workshop in Cologne Representations and cohomology*; University of Cologne. GERMANY
- December 8–20, 2008: participant at *International conference on cluster algebras and related topics*: Workshop: (December 8–13) in Morelia (Mexico) and Conference (December 15–20) in Mexico city. MEXICO.
- July 13–27, 2008: participant at *Socrates Intensive Program GAMAP, Geometric and Algebraic Methods with Applications in Physics*; University of Antwerp, Department of Mathematics and Computer Science. BELGIUM.
- June 22–28, 2008: participant at *Symmetries in mathematics and physics*, conference in honour of the 65th birthday of Prof. Victor G. Kac (MIT). Cortona, ITALY.
- January 3–9, 2008: participant at *Liegrits conference*, Mathematical Institute, University of Oxford. ENGLAND
- October 4–5, 2007: participant at *Maurice Auslander distinguished lectures*, Northeastern University. Boston (MA), USA.
- August 15–24, 2007: participant at *XII International Conference on Representations of Algebras and Workshop*. Torun. POLAND.
- May 10–12, 2007: participant at *Perspectives in Auslander-Reiten Theory. On the occasion of the 65th birthday of Idun Reiten..* Trondheim, NORWAY.
- May 25–27, 2006: participant at *Workshop on Cluster Algebras and Cluster Tilted Algebras*. Bielefeld, GERMANY.
- May 9–13, 2005: participant at *DEA course: “Cluster algebras”*. Luminy, FRANCE.

Communications:

- March 10, 2015. “DFG- SPP1388 annual meeting 2015”, Physikzentrum Bad Honnef (GERMANY). Title of the talk: “Quiver Grassmannians, Schubert varieties and degenerate flag varieties: type A and C”.
- December 2, 2014. Department of Mathematics of the University of Cologne (GERMANY). Title of the talk: “Quiver Grassmannians, Schubert varieties and degenerate flag varieties”.
- August 26, 2014: at “ICRA 2014: International Conference on Representations of Algebras”. Santa (CHINA). Title of the talk: “Quivers with self-duality and isotropic quiver Grassmannians”.
- June 18, 2014: at the conference “Algebraic Structures and Their Applications”. Title of the talk: “Algebras with self-duality and isotropic sub-modules of a self-dual module”.

- January 22, 2014: Seminar "algèbre et géométries" of the Institute Fourier. Grenoble (France). Title of the talk: "Desingularization of quiver Grassmannians for Dynkin quivers".
- November 24, 2013: at "Conference on Geometric Methods in Representation Theory". University of Missouri–Columbia. Title of the talk: "B-orbits of 2-nilpotent elements of classical Lie algebras via symmetric quivers"
- September 13, 2013: at "A.R.T.A. 2013: Advances in Representation Theory of Algebras", Torun (Poland). Title of the talk "Strongly reduced components and CC–algebras".
- May 29, 2013: seminar at Research Group on Cluster Algebras, Università di Bologna. Title of the talk: "Linear independence of cluster monomials for skew–symmetric cluster algebras".
- April 22, 2013: at Maurice Auslander Distinguished Conference, Woods Hole (MA), USA. Title of the talk "Desingularization of quiver Grassmannians for Dynkin quivers".
- August 14, 2012: at *parallel session of ICRA. XV*, University of Bielefeld (Germany). Title of the talk: "Desingularization of quiver Grassmannians".
- July 6, 2012: at *Seminar on Cluster Algebras*, Mathematical Department of the University of Bonn (Germany). Title of the talk: "Degenerate flag varieties: moment graphs and Schröder numbers".
- April 29, 2012: at *Auslander Lectures International Conference*, Wood Hole (MA). Title of the talk: "On linear independence of cluster monomials and application to positivity in cluster algebras".
- October 21, 2011: at *Seminar on Cluster Algebras*, Mathematical Department of the University of Bonn (Germany). Title of the talk: "Atomic bases of cluster algebras".
- February 21, 2011: at *HIM*, Bonn (Germany). Title of the talk: "Positivity in cluster algebras".
- December 9, 2010: at *mini-workshop in Algebra*, NCTS, Tainan (Taiwan). Three seminars: "Cluster Algebras and Quiver Representations: definitions and motivations "; "Cluster Algebras of type affine $A_2^{(1)}$ "; "Geometry of quiver Grassmannians and applications to cluster algebras".
- November 22, 2010: at *working group about Bridgeland's semistability*, Rome. Title: "Introduzione alla classificazione delle rappresentazioni di quiver".
- August 12, 2010: at *ICRA XIV: XIV International Conference on Representations of Algebras and workshop*, Tokyo (Japan). Title of the talk: "Positivity in cluster algebras".
- April 26, 2010: at *Maurice Auslander distinguished lectures and international conference*, Woods Hole (MA). Title of the talk: "Quiver Grassmannians and cluster algebras of Kronecker type".
- January 22, 2010: at *Advanced School and Conference on Homological and Geometrical Methods in Representation Theory*, Trieste (Italy). Title of the talk: "Quiver Grassmannians associated with the Kronecker quiver".
- From October to December 2009 I gave a series of lectures on "Monoidal categorification of cluster algebras" at *Dipartimento di Matematica, Sapienza Università di Roma*, Rome (Italy).
- May 6, 2009: at *Seminari di Algebra e Geometria, Dipartimento di Matematica, Sapienza Università di Roma*, Rome (Italy). Title of the talk: "Quiver Grassmannians and cluster algebras".
- April 2009: at *Maurice Auslander distinguished lectures and international conference; Northeastern University, Mathematics department*. Title of the talk: "Euler-Poincaré characteristic of quiver grassmannians associated with thinly graded modules".
- March 17, 2009: at *Seminario MALGA: Joint algebra seminar between Università degli Studi di Padova and Università di Verona*". Title of the talk: "Genericity in 2-CY categories with a cluster tilting object"
- March 2, 2009: at *Workshop in Cologne Representations and cohomology; University of Cologne*. Title of the talk: "Euler–Poincaré characteristic of quiver grassmannians".
- November 7 and 14, 2008: at *Université Paris Diderot - Paris 7; Groupe d'étude "Algèbres amassées"*. Title of the talks: "Cluster algebras from surfaces in affine type A, I and II, (after R. Schiffler)".
- February 13, 2008: at *Seminario dottorato dell'Università degli Studi di Padova*. Title of the talk: "Cluster algebras: some motivating examples for their introduction"

- June 6, 2007: at *Seminari di Algebra e Geometria, Dipartimento di Matematica, Sapienza Università di Roma, Rome (Italy)*. Title of the talk: “Positivá e base canonica di un’algebra cluster di tipo $A_2^{(1)}$:un approccio geometrico,1”
- June 13, 2007: *Seminario di Algebra e Geometria dell’ Università degli Studi di Roma ”La Sapienza”*. Title of the talk: ”Positivá e base canonica di un’algebra cluster di tipo $A_2^{(1)}$:un approccio geometrico,2”
- at *parallel section of ICRA XII*. Title of the talk: ”Positivity and canonical basis in rank 3 cluster algebras of affine type”
- June 16, 2007: at Università di Roma ”Tor Vergata”, Dipartimento di matematica. Title of the talk: ”Canonical bases and quiver Grassmannians in some cluster algebras of affine type”
- December 15, 2005: at Università di Padova, Dipartimento di matematica. Title of the talk: ”Cluster algebras of geometric type of finite type”.

Long term abroad experiences:

- From September to December 2008 I visited Professor Bernhard Keller in Paris. I was supported by a grant of the University of Padua.
- During my phd-program I spent the spring semester (January–April) 2006, the spring semester 2007 and the fall semester (September–December) 2007 at Northeastern University, Boston (Ma) under the supervision of Professor Andrei Zelevinsky.

TEACHING EXPERIENCES

- First Semester 2014/2015: 30 hours Graduate Course: “Tilting, Mutazioni e Gruppi Algebrici”. In collaboration with Prof. C. De Concini. Sapienza–Università di Roma.
- Second Semester 2013/2014: 15 hours Graduate Course: “An introduction to Cluster Algebras”. Sapienza–Università di Roma.
- May 28, May 31, June 4, and June 7, 2013: 10 hours lecture series on ”Quiver representations and Gabriel’s theorem” at Department of Mathematics of the University of Padova. The series of lectures was part of the course ”Representation theory of groups” held by Giovanna Carnovale and was financed by the University of Padova.

Tutor of the following courses :

- March– June 2015. Algebra 1. Dipartimento di Matematica. Sapienza-Università di Roma. Coordinator: Corrado De Concini.
- March– June 2014. Algebra 1. Dipartimento di Matematica. Sapienza-Università di Roma. Coordinator: Corrado De Concini.
- *September–December* 2010: Algebra lineare 1, Dipartimento di Matematica. Roma. Coordinator : Domenico Fiorenza.
- *April–June* 2007: Matematica 3, Dipartimento di Matematica. Padova. Coordinator : Maurizio Candilera.
- *October–November* 2006: Corso di Matematica, Facoltà di Biotecnologie. Padova. Coordinator : Riccardo Colpi.
- *October–December* 2005: Matematica 1, Dipartimento di matematica. Padova. Coordinator : Maurizio Candilera.
- *April–June* 2005: Matematica 3, Dipartimento di Matematica. Padova. Coordinator : Maurizio Candilera.

Rome, March 11, 2016

Giovanni Cerulli Irelli

