Andrea Appel

Curriculum Vitae

Università di Parma
Parco Area delle Scienze, 53/A
43124, Parma (PR), ITALY
☐ +39 0521906563
✉ andrea.appel@unipr.it
🌐 www.aqualab.unipr.it/appel

Research Interests

Representation Theory, Mathematical Physics

Current Employment

2023   **Associate Professor in Algebra**, *Università di Parma*, Italy

Previous Appointments

2020 - 2022   **Assistant Professor**, *Università di Parma*, Italy
2017 - 2020   **Research Fellow**, *University of Edinburgh*, UK
2014 - 2017   **Assistant Professor**, *University of Southern California*, Los Angeles, USA
2013   **Research Fellow**, *Hebrew University of Jerusalem*, Israel

Education

2013   **Ph.D. in Mathematics**, *Northeastern University*, Boston, USA
Advisor: Prof. V. Toledano Laredo

2008   **M.Sc. in Mathematics**, *Sapienza Università di Roma*, Italy
Advisor: Prof. C. De Concini.

2006   **B.Sc. in Mathematics**, *Sapienza Università di Roma*, Italy
Advisor: Prof. M.J. de Resmini

ASN

Abilitazione Scientifica Nazionale alle funzioni di professore universitario di Prima Fascia nel Settore Concorsuale 01/A2 - GEOMETRIA E ALGEBRA. Validità: 24/10/2023 - 24/10/2034.

Active Research Group Affiliations

INdAM, *Istituto Nazionale di Alta Matematica*
Research Group GNSAGA - Gruppo Nazionale Strutture Algebriche, Geometriche ed Applicazioni.

INFN , *Istituto Nazionale di Fisica Nucleare, Gruppo Collegato di Parma*
Research Group GAST - Gauge and String Theory.

CaLISTA, *COST Action 2022-2026*
CA21109 - Cartan geometry, Lie, Integrable Systems, quantum group Theories for Applications.

Preprints

Publications

- *The R-matrix of the affine Yangian* (with S. Gautam and C. Wendlandt).
  Journal of the European Mathematical Society (2026). Accepted for publication.
  arXiv:2309.02377, 57pp.

- *Trigonometric K-matrices for finite-dimensional representations of quantum affine algebras* (with B. Vlaar).
  Journal of the European Mathematical Society (2025), 41pp. Published online first.
  DOI:10.4171/jems/1686. arXiv:2203.16503.

- *Boundary transfer matrices arising from quantum symmetric pairs* (with B. Vlaar).
  Indagationes Mathematicae (2025), 33pp. Article in press.
  Special Issue dedicated to Tom Koornwinder.
  DOI:10.1016/j.indag.2025.05.008. arXiv:2410.21654.

- *Tensor K-matrices for quantum symmetric pairs* (with B. Vlaar).
  Communications in Mathematical Physics 406 (2025), no. 5, art. 100.
  DOI:10.1007/s00220-025-05241-5. arXiv:2402.16676, 42pp.

- *Monodromy of the Casimir connection of a symmetrisable Kac–Moody algebra* (with V. Toledano Laredo).
  Inventiones Mathematicae 236 (2024), 124pp.
  DOI:10.1007/s00222-024-01242-8. arXiv:1512.03041.

- *Pure braid group actions on category $\mathcal{O}$ modules* (with V. Toledano Laredo).
  Pure and Applied Mathematics Quarterly 20.1 (2024), 51 pp.
  Special Issue dedicated to Corrado De Concini.
  DOI:10.4310/PAMQ.2024.v20.n1.a3. arXiv:2208.05331.

- *Generalized Schur-Weyl duality for quantum affine symmetric pairs and orientifold KLR algebras* (with T. Przèzdziecki).
  Advances in Mathematics 435 (2023), Part B, 109383, 52pp.
  DOI:10.1016/j.aim.2023.109383. arXiv:2204.04123.

- *On a conjecture of Khoroshkin and Tolstoj* (with S. Gautam and C. Wendlandt).
  International Mathematics Research Notices - IMRN, 2023 (2023) no.24, 17pp.
  DOI:10.1093/imrn/rnac334. arXiv:2206.14857. Oberwolfach Report.

- *Universal K-matrices for quantum Kac–Moody algebras* (with B. Vlaar).
  Representation Theory 26 (2022), 61pp.
  DOI:10.1090/ert/623. arXiv:2007.09218.

- *Continuum Kac–Moody algebras* (with F. Sala and O. Schiffmann).
  Moscow Mathematical Journal 22 (2022) no.2, 48pp.
  DOI:10.17323/1609-4514-2022-22-2-177-224. arXiv:1812.08528.

- *Quantization of continuum Kac–Moody algebras* (with F. Sala).
  Pure and Applied Mathematics Quarterly 16 (2020) no.3, 55pp.
  Special Issue dedicated to Kyoji Saito.
  DOI: 10.4310/PAMQ.2020.v16.n3.a5. arXiv:1903.01413.

- *An explicit isomorphisms between quantum and classical $\mathfrak{sl}_n$* (with S. Gautam).
  Tranformation Groups 25 (2020) no.4, 36pp.
  DOI:10.1007/s00031-019-09543-6. arXiv:1712.03601.

- *Coxeter categories and quantum groups* (with V. Toledano Laredo).
  Selecta Mathematica (N.S.) 25 (2019), no.3, 97pp.
  DOI:10.1007/s00029-019-0490-y. arXiv:1610.09741.

- *Uniqueness of Coxeter structures on Kac–Moody algebras* (with V. Toledano Laredo).
  Advances in Mathematics 347 (2019), 104pp.
  DOI:10.1016/j.aim.2019.02.022. arXiv:1508.01945.

- *A 2–categorical extension of Etingof–Kazhdan quantisation* (with V. Toledano Laredo).
  Selecta Mathematica (N.S.) 24 (2018), no.4, 89pp.
  DOI:10.1007/s00029-017-0381-z. arXiv:1610.09744.

- *A DG-extension of symmetric functions arising from higher representation theory* (with I. Egilmez, M. Hogancamp, A. Lauda).
  Journal of Combinatorial Algebra 2 (2018), no.2, 45pp.
  DOI:10.4171/JCA/2-2-3. arXiv:1704.00713.

Other

- *The Interplay of R-matrices and Quantum Groups* (Proceedings of the conference GABY 2024).
  Advances in Group Theory and Applications 20 (2025), pp. 60.
  DOI:10.32037/agta-2025-001.

- *Generalized Schur-Weyl dualities, quantum affine symmetric pairs, and orientifold Khovanov-Lauda-Rouquier algebras* (with T. Przezdziecki).
  Contribution in **Oberwolfach Report: Three Facets of R-matrices**, 17-23 October 2021
  DOI: 10.4171/OWR/2021/51
- *Quasi–Coxeter categories and a relative Etingof–Kazhdan functor* (with V. Toledano Laredo).
  Superseded by the publications Sel. Math. N.S. 2018 and 2019. arXiv:1212.6720, 63pp.

Thesis

- **Monodromy theorems in the affine setting**, *Ph.D. Thesis*
  hdl.handle.net/2047/d20003201

Research Grants

2024-2026 **PRIN - Progetto di Ricerca di Rilevante Interesse Nazionale**, *Algebraic Aspects of 2dQFT with reflection symmetry*, PRIN ID: 2022HMBTTL - CUP: D53C24003390001
Role: co-Principal Investigator and Local Coordinator of the Research Unit at the University of Parma.
Scope: Research Funds. Amount: €125.162,00. Website: UNIPR, SAPIENZA

2024-2026 **Progetto di Ricerca INdAM 2024 - Linea 2 Consolidator Grants**, *Bispectrality and Boundary Phenomena in Quantum Groups*, CUP: E53C23001740001
Role: Principal investigator. Scope: Research Funds. Amount: €30.000,00.

2024-2025 **Progetto d'Ateneo Università di Parma**, *Bispectrality and Boundary Phenomena in Quantum Groups*, Bando di Ateneo per la Ricerca 2024 Linea D.
Role: Principal investigator. Scope: Research Funds. Amount: €23.891,00.

2023-2024 **Progetto d'Ateneo Università di Parma**, *Quantum groups at root of unity and integrable systems with boundary*, Bando di Ateneo per la Ricerca 2022 Linea B (Young Researchers) - Partially funded by Fondazione Cariparma.
Role: Principal investigator. Scope: Research Funds. Amount: €8.500,00.

2021-2022 **Progetto d'Ateneo Università di Parma**, *Reflection Symmetries arising from quantum loop algebras*, Bando di Ateneo per la Ricerca 2020 Linea B (Young Researchers) - Partially funded by Fondazione Cariparma.
Role: Principal investigator. Scope: Research Funds. Amount: €8.500,00.

2020 **Programma per giovani ricercatori Rita Levi Montalcini 2018 (D.M. 511 - 24/8/2020)**
Role: Principal investigator. Scope: Salary and Research Funds. Amount: €180,481.44 + €43,000.
Notes: grant declined. Link.

2015-2017 **AMS–Simons Travel Grant**, *AMS–Simons Foundation*
Role: Principal Investigator. Scope: Research Funds. Amount: $4,000

Research Training

2026 **Postdoc Supervision**, *Dr. Simone Castellan, University of Parma*
1-Year Postdoctoral Fellowship funded by PRIN Grant 2022HMBTTL

2025 **Postdoc Supervision**, *Dr. Alessandro Carotenuto, University of Parma*
1-Year Postdoctoral Fellowship funded by University of Parma

2019-2020 **IAD Action Grant**, *Institute for Academic Development, University of Edinburgh*
Role: Coordinator. Scope: Academic projects aimed at PhD students and Postdocs. Amount: £6,500

Fellowships

2013 **Dissertation Completion Fellowship**, Northeastern University
01/01/2013–30/04/2013. Scope: Semester salary (4 months, research only). Amount: approx. $18,000

2011 **Ling-Ma Fellowship**, Northeastern University
01/06/2011–31/07/2011. Scope: Summer Salary (research only). Amount: approx. $5,000

2008 **University Excellence Fellowship**, Northeastern University
2008–2013. Scope: Additional research funds. Amount: $25,000

Visiting positions

2026 **Erwin Schrödinger International Institute for Mathematics and Physics, ESI**, Vienna, Austria
Research in Groups with J. Li, T. Przèzdziecki, and B. Vlaar - 2 weeks

2025 **Erwin Schrödinger International Institute for Mathematics and Physics, ESI**, Vienna, Austria
Research in Groups with J. Li, T. Przèzdziecki, and B. Vlaar - 2 weeks

2025 **International Centre for Mathematical Sciences**, Edinburgh, UK
Research in Groups with J. Li, T. Przèzdziecki, and B. Vlaar - 2 weeks

2024 **Beijing Institute for Mathematical Sciences and Applications**, Beijing, China
Research visit - 2 weeks

2023 **Centro Internazionale per la Ricerca Matematica**, Trento, Italy
Research in Pairs with S. Gautam and C. Wendlandt - 3 weeks

2021 **Mathematisches Forschungsinstitut Oberwolfach**, Germany
Research in Pairs with S. Gautam and C. Wendlandt - 2 weeks

2019 **Aspen Center for Physics**, Colorado, USA
Summer Program - 3 weeks

2017 **Institut des Hautes Études Sciéntifiques IHES**, France
Research visit - 1 month

2015 **IAS Park City Mathematical Institute**, Utah, USA
Summer Program - 3 weeks

2014 **Institut des Hautes Études Sciéntifiques IHES**, Paris, France
Research visit - 1 month

2014 **Hebrew University**, Jerusalem, Israel
Research visit - 1 months

2012 **Columbia University**, NY, USA
Research visit - 4 months

2012 **Forschungsinstitut für Mathematik, ETH**, Zurich, Switzerland
Research program - 1 month

Conference Talks

2026 **Physical Mathematics 2026**, *Seul National University, South Korea*
June 15–19, 2026 Link

2026 **Q-SPHERE 2026**, *Radboud University, Netherlands*
June 8–12, 2026 Link

2026 **XI International Workshop on Non-associative Algebras**, *Università di Bari, Italy*
April 13–17, 2026 Link

2026 **Quantum Groups Days**, *Université de Lille, France*
April 2–3, 2026 Link

2025 **New Perspectives in Quantum Representation Theory**, *ICMS, Edinburgh, UK*
November 17–21, 2025. Link

2025 **The RepNet Launch Party**, *University of York, UK*
July 29–30, 2025 Link

2025 **All around Integrability**, *University of Modena and Reggio Emilia, Italy*
June 3-4-5, 2025. Link

2025 **Solving the Yang–Baxter Equation. New Frontiers and Approaches**, *Levico Terme, Italy*
May 4–8, 2025. Link

2024 **Hopf algebras and Monoidal Categories**, *Università di Ferrara, Italy*
September 3-6, 2024. Link

2024 **RTISART-2024: Representation Theory, Integrable Systems and Related Topics** , *BIMSA, China*
July 8-12, 2024. Link

2024 **Perspectives in Representation Theory - 9ECM Satellite Conference**, *Coimbra, Portugal*
July 1-3, 2023. Link

2024 **Higher structures 2024**, *Caprarola, Italy*
February 29 - March 2, 2024. Link

2023 **Taipei Conference in Representation Theory VII**, *Taipei, Taiwan*
December 18-22, 2023. Link

2023 **VI International Workshop on Non-associative Algebras**, *Universidad Politécnica de Madrid, Spain.*
June 19-23, 2023. Link

2023 **Higher structures 2023**, *Caprarola, Italy*
February 15-17, 2023. Link

2022 **New trends in Hopf algebras and Monoidal Categories**, *Università di Torino, Italia.*
September 6-9, 2022. Link

2021 **Three facets of R-matrices**, *Mathematisches Forschungsinstitut Oberwolfach, Germany*
October 17-22, 2021 - Link

2020 **Tensor Categories, Quantum groups, and Related Topics**, *Nottingham, UK*
June 29 - July 1, 2020 - Link

2019 **Lie Theory Session, XXI Congress of the Italian Mathematical Union**, *Pavia, Italy*
September 2019 - Link

2019 **Moduli Spaces, Representation Theory and Quantization**, *RIMS, Kyoto University*
June 2019 - Link

2019 **Geometry and Mathematical Physics Workshop**, *Loughborough University*
March 2019 - Link

2019 **Representation theory, gauge theory and integrable systems**, *Kavli IPMU, Tokyo*
February 2019 - Link

2019 **Aspects of Higher Representation Theory**, *Brussels, Belgium*
January 2019 - Link

2017 **Conference on Geometric Representation Theory**, *University of Glasgow*
July 2017 - Link

2015 **US–Mexico Conference in Representation Theory and Noncommutative algebra**, *UNAM, Mexico City*
January 2015 - Link

2014 **Algebraic Geometry and Representation Theory in Rome**, *Università Roma Tre, Italy*
December 2014

2014 **Second Joint International Meeting IMU–AMS, Special Session on Mirror Symmetry and Representation Theory**, *Tel Aviv Univerisity, Israel*
June 2014 - Link

2014 **Quantum groups, Deformation and Geometry - A Conference in memory of J. Donin**, *Bar-Ilan University, Israel*
June 2014 - Link

2013 **AMS Meeting**, *University of California Riverside*
Novembre 2013 - Link

Lecture Series

2024 **GABY: Groups & Algebras in Bicocca for Young algebraists**, *Università di Milano Bicocca, Italy*
June 17-21, 2024. Link

Organization of conferences and workshops

2024 **New Perspectives in Yangians and Quantum Affine Algebras**, *Parma, Italy*, October 1-3, 2024.
Organizers: A. Appel, C. Meneghelli. Link

2024 **Quantization in Representation Theory, Derived Algebraic Geometry, and Gauge Theory**, *SwissMAP Research Station at Les Diablerets, Switzerland*, September 16-20, 2024.
Organizers: A. Appel, L. Bossinger, G. Felder, M. Porta, F. Sala, O. Schiffmann. Link

2021 **Quantization in Derived Algebraic Geometry and Representation Theory**, *Casa Matemática Oaxaca, Mexico*, May 2–7, 2021
Organizers: A. Appel, M. Porta, F. Sala, O. Schiffmann. Cancelled due to Covid Emergency. Link.

2019 **Quantum groups and integrable systems - 56th ARTIN Meeting**, *University of Edinburgh*, Nov. 28-29, 2019
Organizers: A. Appel, D. Valeri.

2016 **US–Mexico Conference in Representation Theory, Categorification, and Noncommutative algebra**, *University of Southern California, Los Angeles*, May 30 - June 3, 2016
http://www-bcf.usc.edu/ ~lauda/US-MEX-2016/conference2016.html
Organizers: A. Appel, A. Lauda, C. Geiss, M. Yakimov

2014 **Workshop on Categorification and Representation Theory**, *University of Southern California, Los Angeles*, October 30-31, 2014
Organizers: A. Appel, A. Lauda, D. Rose

Young Researchers Meetings in Algebra and Geometry

since 2025 **YRMAG Steering Committee**, Member

2025 **Young Researchers Meeting in Algebra and Geometry in Modena**, September 10-12, 2025
Funded by INdAM-GNSAGA, Università di Modena e Reggio Emilia. Link
Organizers: A. Appel, L. Capuano, F. Carocci, C. Felisetti, F. Sala, R. Svaldi, M. Talpo

2024 **Young Researchers Meeting in Algebra and Geometry in Milano**, September 23-25, 2024
Funded by INdAM-GNSAGA, Università di Milano. Link
Organizers: A. Appel, F. Binda, L. Pertusi, F. Sala, R. Svaldi, M. Talpo

2023 **Young Researchers Meeting in Algebra and Geometry in Roma**, September 20-22, 2023
Funded by INdAM-GNSAGA, Università di Roma Tre. Link
Organizers: A. Appel, F. Binda, L. Capuano, F. Sala, M. Talpo

2022 **Young Researchers Meeting in Algebra and Geometry in Trieste**, September 28-30, 2022
Funded by INdAM-GNSAGA, SISSA, Università di Pisa. Link
Organizers: A. Appel, A. Lerario, F. Sala, S. Scherotzke, N. Sibilla, M. Talpo

2021 **Young Researchers Meeting in Algebra and Geometry in Pisa**, September 30 - October 1, 2021
Funded by INdAM-GNSAGA, Università di Pisa, Scuola Normale Superiore di Pisa, Politecnico di Milano.
Organizers: A. Appel, A. Hochenagger, M. Porta, F. Sala, S. Scherotzke, M. Talpo

Teaching - Graduate Courses - PhD Level

Topics in Representation Theory
Since 2022, I offer **every year** a 24h advanced course in Representation Theory. This is part of the joint Ph.D. Program of the Universities of Parma, Modena/Reggio Emilia, and Ferrara. The course is typically held online, and the participation is open to graduate students from other universities.

2021 **Yangians in geometry and representation theory**
Joint course with University of Pisa and University of Rome Tor Vergata.

2016 **Infinite-dimensional Lie groups**
University of Southern California Los Angeles

2015 **Quantum groups and differential equations**
University of Southern California Los Angeles

Academic duties and responsibilities

since 2025 **Responsabile dell'Assicurazione della Qualità**, *Corso di Laurea in Matematica*
Department of Mathematics, Physics, and Computer Science - University of Parma

since 2023 **Commissione Mobilità Internazionale**, *International Mobility Committee*
Department of Mathematics, Physics, and Computer Science - University of Parma

since 2023 **Redazione Web**, *Web Editorial Board*
Department of Mathematics, Physics, and Computer Science - University of Parma

since 2021 **Comitato di Area 01**, *Scientific Committee - Mathematics and Computer Science*
Department of Mathematics, Physics, and Computer Science - University of Parma

Languages

Italian, English, French

Research Profiles

ORCID   0000-0002-6446-9305
Scopus   57200223562
GScholar yp-THkMAAAAJ