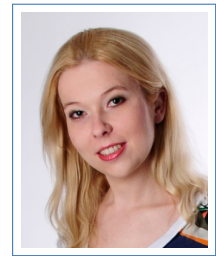


# Katarzyna Rejzner

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## Education

- 2011 October, *Ph.D. in physics, summa cum laude*, University of Hamburg.
- 2009 June, *M.Sc. in physics, grade A with honours*, Jagiellonian University in Cracow.

## Research experience

- 09/2013- present **Lecturer in mathematics**, University of York, United Kingdom.
- 07/2012- 08/2013 **Post-doc in mathematics**, University of Rome Tor Vergata (INdAM-Cofund fellowship financed by Marie Curie Actions), Italy.
- 09/2012- 12/2012 **Participant and co-organizer in the Junior Hausdorff Trimester Program**, Hausdorff Research Institute for Mathematics, Bonn, Germany.
- 11/2011- 06/2012 **Post-doc in mathematics**, University of Hamburg, Germany.

## PUBLICATIONS

- 2015 K. Rejzner, *Remarks on local symmetry invariance in perturbative algebraic quantum field theory*, *Annales Henri Poincaré* **16** (2015), 205-238, [arXiv:math-ph/1301.7037].
- 2014 K. Fredenhagen, K. Rejzner, *QFT on curved spacetimes: axiomatic framework and examples*, [arXiv:math-ph/1412.5125].
- 2014 R. Brunetti, M. Dütsch, K. Fredenhagen, K. Keller, K. Rejzner, *Dimensional Regularization in Position Space, and a Forest Formula for Epstein-Glaser Renormalization*, *J.Math.Phys.* **55** (2014), 122303, [arXiv:math-ph/1311.5424].
- 2013 R. Brunetti, K. Fredenhagen, K. Rejzner, *Quantum gravity from the point of view of locally covariant quantum field theory*, [arXiv:math-ph/1306.1058 ].
- 2013 K. Fredenhagen, K. Rejzner, *Batalin-Vilkovisky formalism in perturbative algebraic quantum field theory*, *Commun. Math. Phys.* **317** (2013), 697-725, [arXiv:math-ph/1110.5232].
- 2012 K. Fredenhagen, K. Rejzner, *Perturbative algebraic quantum field theory*, to be published in the proceedings of the Les Houches Winter School in Mathematical Physics (January 29 - February 3, 2012), [arXiv:math-ph/1208.1428].

- 2012 R. Brunetti, K. Fredenhagen, P. Imani, K. Rejzner, *The Locality Axiom in Quantum Field Theory and Tensor Products of  $C^*$ -algebras*, Rev. Math. Phys. **26** (2014) 1450010, [arXiv:math-ph/1206.5484].
- 2012 K. Fredenhagen, K. Rejzner, *Batalin-Vilkovisky formalism in the functional approach to classical field theory*, Commun. Math. Phys. **314** (2012) 93-127, [arXiv:math-ph/1101.5112].
- 2012 D. Bahns, K. Rejzner, J. Zahn, *The effective theory of strings*, Commun. Math. Phys. **327** (2014) 779-814, [arXiv:math-ph/1204.6263].
- 2011 K. Rejzner, *Batalin-Vilkovisky formalism in locally covariant field theory*, Ph.D. thesis, DESY-THESIS-2011-041, Hamburg, [arXiv:math-ph/1110.5130].
- 2011 A. Herdegen, K. Rejzner, *Spacelike localization of long-range fields in a model of asymptotic electrodynamics*, Annales Henri Poincaré **12** (2011) 1387-1415, [arXiv:hep-th/1103.1055].
- 2011 K. Rejzner, *Fermionic fields in the functional approach to classical field theory*, Rev. Math. Phys. **23** (2011) 1009-1033, [arXiv:math-ph/1101.5126].
- 2009 K. Rejzner, F. Fayette, M. W. Krasny, W. Placzek, A. Siodmok, *A strategy for precision measurements of the W-boson mass and width at the LHC*, PoS (2009) 095, proceedings of the conference HCP 2009, 16-20 November 2009.

## LANGUAGES

- Polish **mother tongue**  
 English **Proficiency (C2)**  
 German **Advanced (C1)**  
 Italian **Intermediate (B1)**  
 Russian **Intermediate (B1)**

## PRIZES

- 2012 Prize granted by the Association of the Friends and Sponsors of DESY for an outstanding Ph.D. thesis based on the research program at DESY
- 2012 Prize given by the University of Hamburg for theses defended *summa cum laude*

## SCHOLARSHIPS

- 2012 Receiving an "incoming type" grant of the INdAM-COFUND, a fellowship of Istituto Nazionale di Alta Matematica "F. Severi" cofunded by Marie Curie Actions.
- 2009-2011 Scholar of the doctoral fellowship of Evangelisches Studienwerk e.V. Villigst.
- 2005-2008 Receiving four times the scholarship given by the Polish Ministry of Education.

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## TEACHING

- 2013-present** all terms, *University of York*, supervising Bachelor, Master and Ph.D. students.
- 2014-present** **Spring and summer term**, *University of York*, undergraduate course *Classical Mechanics*.
- 2013** **Summer semester 2013**, *University of Rome "Tor Vergata"*, a mini-course for Ph.D. students in mathematics, *QFT on curved spacetimes: axiomatic framework and applications*.
- 2011-2012** **Winter and summer semester 2011/12**, *University of Hamburg*, Co-supervising a master student Paniz Imani (Master Programme in Mathematical Physics).
- 2012** **6-11 February**, *University of Hamburg*, a series of lectures for Ph.D. students in mathematics, *QFT for mathematicians*.

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## TALKS AT SEMINARS AND RESEARCH VISITS

- 2014** **4 December**, *Renormalized quantum BV formalism in the Epstein-Glaser framework*, Zürich, Switzerland.
- 2014** **18 November**, *The BV formalism and new perspective on observables in effective quantum gravity*, Leipzig, Germany.
- 2014** **28 October**, *New perspective on relational observables in effective quantum gravity*, Erlangen, Germany.
- 2014** **26 June**, *Einstein causality in locally covariant quantum field theory*, Cardiff, UK.
- 2014** **9-14 June**, *lecture series on the BV formalism*, Lyon, France.
- 2014** **15 May**, *From locally covariant QFT to quantum gravity*, Perimeter Institute, Canada.
- 2014** **9-10 April**, *Introduction into pAQFT*, University of Nottingham, UK.
- 2014** **19 March**, *Mathematical structures in quantum field theory: from functional analysis to geometry*, University of York, UK.
- 2013** **6 November**, *Functional analytic aspects of perturbative algebraic quantum field theory*, University of Loughborough, UK.
- 2013** **09 May**, *What can we learn about quantum gravity from locally covariant quantum field theory?*, Mathematical Physics Seminar, University of York, United Kingdom.
- 2013** **18 April**, *Quantum gravity from the point of view of locally covariant quantum field theory*, Séminaire de géométrie et physique mathématique, Institut de Mathématiques de Jussieu, Paris, France.
- 2012** **7 December**, *Cohomology and functional analysis at work in renormalization of gauge theories*, Séminaire de Physique Mathématique, Université Claude Bernard Lyon 1, Lyon, France.
- 2012** **15 October**, *Local gauge invariance in perturbative algebraic quantum field theory*, the Trimester Seminar at the Hausdorff Research Institut for Mathematics, Bonn, Germany.

- 2012 **29 June**, *The Locality Axiom in Quantum Field Theory and Tensor Products of  $C^*$ -algebras*, the seminar of the AQFT group in Hamburg, Germany.
- 2012 **25 May**, *Theories with local symmetries in the algebraic approach to perturbative quantization*, the seminar of the field theory group, Cracow Jagiellonian University, Poland.
- 2012 **5 April**, *Gauge theories in the algebraic approach to perturbative quantization*, Séminaire de géométrie et physique mathématique, Institut de Mathématiques de Jussieu, Paris, France.
- 2012 **2 April**, *Batalin-Vilkovisky formalism in locally covariant field theory*, Séminaire d'analyse algébrique, Institut de Mathématiques de Jussieu, Paris, France.
- 2011 **10 November**, *Local gauge invariance in perturbative algebraic quantum field theory*, Department of Mathematics, University of Rome "Tor Vergata", Italy.
- 2011 **12 July**, *BV formalism and observables in general relativity*, Mathematics Institute, University of Göttingen, Germany.
- 2011 **07 July**, *Applications of the infinite dimensional calculus in the functional approach to classical field theory*, Research Seminar "Lie Theory", Institute of mathematics, University of Paderborn, Germany.
- 2011 **06 June**, *Impresje algebraiczne na temat kwantowej teorii informacji ( Quantum information theory. Impressions by an algebraist)*, the seminar "Chaos and Quantum Information", Cracow Jagiellonian University, Poland.
- 2011 **03 June**, *BV formalism in locally covariant field theory*, the seminar of the field theory group, Cracow Jagiellonian University, Poland.
- 2011 **12 April**, *Geometrical interpretation of the BV formalism and its application to classical gravity*, the seminar of the AQFT group in Hamburg, Germany.
- 2011 **08 April**, *BV formalism in the functional approach to classical gravity*, the seminar of the theory group at the Warsaw University, Poland.
- 2011 **08 April**, *Local covariance principle and perspectives in quantum gravity*, the seminar of the theory group at the Warsaw University.
- 2010 **23 June**, *BRST in a nutshell*, the seminar on Lie algebra cohomology held at the mathematics department of the University of Hamburg.
- 2010 **08 January**, *Locally covariant quantum field theory as a way to quantum gravity*, the seminar of field theory group at the Physics Institute of the Cracow Jagiellonian University.
- 2010 **07 January**, *Introduction into locally covariant quantum field theory*, the seminar of differential geometry group at the Mathematics Institute of the Cracow Jagiellonian University.
- 2009 **29 October**, *Pedagogical introduction into algebraic quantum field theory*, the seminar of differential geometry group at the Mathematics Institute of the Cracow Jagiellonian University.
- 2009 **12 May**, *Algebra of asymptotic fields in electrodynamics*, the mathematical physics seminar at II. Institute for Theoretical Physics in Hamburg.

2008 02 Juni, *The localization properties at null infinity*, the quantum field theory seminar at the University of Göttingen.

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## CONFERENCES

### Invited talks

- 2014 14-18 July, *Frontiers of Fundamental Physics*, Marseille, France, *pAQFT as a universal framework for constructing physically motivated models in quantum field theory*.
- 2014 19-23 May, *Algebraic Quantum Field Theory: Its Status and Its Future*, ESI, Vienna, Austria, *Perturbative algebraic quantum field theory: recent results and new perspectives*.
- 2014 24-28 February, *Batalin-Vilkovisky Algebras, Operads, and Hopf Algebroids*, Oberwolfach mini-workshop, MFO, Germany, .
- 2014 6-10 January, *Approaches to Quantum Gravity*, Clermont-Ferrand, France, *Background independence of quantum gravity in the framework of general local covariance*.
- 2013 08-13 September, *Geometry of Strings and Fields*, Florence, Italy, *Effective quantum gravity as a locally covariant QFT*.
- 2013 22-27 July, *New Crossroads between Mathematics and Field Theory*, Oberwolfach mini-workshop, MFO, Germany, *Local gauge symmetries in locally covariant field theory*.
- 2013 8-12 July, *Mathematics and Quantum Physics*, Rome, Italy, *Interplay between Gravity and Quantum Physics from the Point of View of General Local Covariance*.
- 2012 17-19 December, *Noncommutative Geometry and Applications to Physics*, Milano, Italy, *Locally covariant QFT as a way to quantize geometrical structures*.
- 2012 17-21 September, *Renormalization at the confluence of analysis, algebra and geometry*, Luminy (Marseille), France, *Renormalized Batalin-Vilkovisky formalism in perturbative algebraic quantum field theory*.
- 2012 5-7 September, *String Theory and Algebraic Geometry*, Bristol, Great Britain, *Algebraic and combinatorial structures in Epstein-Glaser renormalization*.

### Contributed talks

- 2014 14-15 November, *35th Workshop "Foundations and Constructive Aspects of QFT"*, Wuppertal, Goslar, *New perspective on algebraic structures in Epstein-Glaser renormalization* .
- 2014 26 September - 3 October, *Simons Center Workshop "Homological Methods in Quantum Field Theory"*, Stony Brook, USA, *BV algebras in perturbative algebraic quantum field theory*.
- 2014 15-19 September, *Numbers and Physics*, Madrid, Spain, *Geometrical interpretation of the Stueckelberg-Peterman renormalization group*.
- 2014 15 May, *NBMPS*, York, UK, *Analytic regularization in causal perturbation theory: new results and perspectives*.

- 2013 31 May - 1 June, 32nd Workshop "Foundations and Constructive Aspects of QFT", Wuppertal, Germany, *Quantum gravity from the point of view of locally covariant QFT*.
- 2013 25 Februar - 1 März, DPG Frühjahrstagung, Jena, Germany, *Diffeomorphism invariant quantum fields in perturbative algebraic quantum field theory*.
- 2012 16-18 October, Symposium "Raum und Materie", Haus Villigst (Schwerte), Germany, *Quantum field theory as a new way to quantum gravity*.
- 2012 12-14 September, *New Trends in Algebraic Quantum Field Theory*, Frascati, Italy, *Einstein causality in Quantum Field Theory and Tensor Products of  $C^*$ -algebras*.
- 2012 6-10 August, *International Congress on Mathematical Physics*, Aalborg, Denmark, *Quantization of theories with local symmetries in perturbative algebraic QFT*.
- 2012 2-6 July, *Periods and Motives*, Madrid, Spain, *New notion of a renormalized time ordered product in perturbative algebraic quantum field theory*.
- 2012 27 February - 1 March, DPG Frühjahrstagung, Göttingen, Germany, *Locally covariant field theory as an approach to quantum gravity*.
- 2012 15-18 February, *Planckland, Quantum Geometry and Matter*, Trieste, Italy, *Quantization of geometrical structures in locally covariant field theory*.
- 2012 16-20 January, *Simons Center Workshop "Mathematical Foundations of Quantum Field Theory"*, Stony Brook, USA, *BV Quantization in perturbative algebraic quantum field theory*.
- 2011 18-19 November, 29th Workshop "Foundations and Constructive Aspects of QFT", Leipzig, Germany.  
*The classical and the quantum master equation in locally covariant field theory*
- 2011 20 September - 1 October, Workshop "Rigorous Quantum Field Theory in the LHC era", Erwin-Schrödinger Institute for Mathematical Physics, Vienna, Austria, *Gauge theories in the algebraic approach to perturbative quantization*.
- 2011 14-16 September, *Modern Trends in AQFT*, Pavia, Italy, *BV Quantization in perturbative AQFT*.
- 2011 20-22 June, 43 Symposium on Mathematical Physics, Toruń, Poland, *Local covariance and observables in general relativity*.
- 2011 15-16 April, *Transformation Groups and Mathematical Physics 7*, Paderborn, Germany, *Batalin-Vilkovisky formalism and General Relativity*.
- 2011 28 March-1 April, DPG Frühjahrstagung, Karlsruhe, Germany, *The BV formalism applied to classical gravity*.
- 2010 19-20 November, 27th Workshop "Foundations and Constructive Aspects of QFT", Leipzig, Germany, *BRST transformation in classical Yang-Mills theories and gravity*.
- 2009 15-20 November, HCP2009 - Hadron Collider Physics Symposium, Evian-les-Bains, France, *A strategy for a Precision Measurement of the W-boson Mass and Width at the LHC*.

## Schools

- 2011 7-16 December, *Winter School on Operator Algebras*, Kyoto, Japan.
- 2010 25-29 January (Masterclass) and February 1-5, 2010 (Workshop), *Von Neumann algebras and group actions*, Copenhagen, Denmark.
- 2009 01-10 June, *Cracow School of Theoretical Physics, XLIX Course*, Zakopane, Poland.
- 2007 20-24 August, *International Summer School on Theoretical Gravitational Wave Astronomy*, Bad Honnef, Germany.
- 2006 14-25 August, *USTP 2006: 5<sup>th</sup> Utrecht Summerschool in Theoretical Physics*, Utrecht, The Netherlands.
- The Summer School has a total standard study-load of 3 ECTS. I successfully completed the USTP 2006 with excellent results.

## Other recent conferences

- 2011 30 July-1 August, *Mathematical Aspects of QFT and QSM*, Hamburg, Germany.  
The Workshop was organized as a satellite conference of the ICMP 2012 in Aalborg and included a day honouring the 90th birthday of Rudolf Haag.
- 2011 1-2 July, *26th Workshop "Foundations and Constructive Aspects of QFT"*, Göttingen, Germany.
- 2011 14-24 June, *Quantum theory and gravitation*, Zürich, Switzerland.
- 2011 16-18 February, *"Foundational Aspects of Cosmology"*, Hamburg, Germany.
- 2010 28 September-1 Oktober, *Quantum field theory and gravity*, Regensburg, Germany.
- 2010 21-24 September, *DESY Theory Workshop "Quantum Field Theory: Developments and Perspectives"*, Hamburg, Germany.
- 2010 23-27 August, *NITHeP Workshop "Quantum Field Theory on Curved Spacetime - From the Algebraic Approach to Local Covariance"*, Durban, South Africa.
- 2010 18-19 June, *26th Workshop "Foundations and Constructive Aspects of QFT"*, Münster, Germany.
- 2010 15-19 March, *DPG Frühjahrstagung*, Bonn, Germany.
- 2010 15-16 January, *25th Workshop "Foundations and Constructive Aspects of QFT"*, Göttingen, Germany.
- 2009 3-8 August, *XVI International Congress on Mathematical Physics*, Prague, Czech Republic.
- 2009 8-9 May, *Noncommutative Picnic*, Cracow, Poland.
- 2009 4-7 February, *SUSY and Cosmology workshop*, Warsaw, Poland.
- 2009 30-31 January, *23<sup>rd</sup> Workshop "Foundations and Constructive Aspects of QFT"*, Göttingen, Germany.
- 2009 5-7 January, *Cracow Epiphany Conference "On hadron interactions at the dawn of the LHC"*, Cracow, Poland.
- 2008 19-21 December, *Quantum Gravity in Cracow<sup>2</sup>*, Cracow, Poland.

- 2008 **6-7 June**, 22<sup>nd</sup> Workshop "Foundations and Constructive Aspects of QFT", Hamburg, Germany.
- 2008 **11 July**, Courant RC Workshop "QFT on noncommutative spacetime", Göttingen, Germany.
- 2008 **4-6 January**, Cracow Epiphany Conference on LHC physics, Cracow, Poland.

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## OTHER EXPERIENCE

### Organization of scientific events

- 2012 **26-28 September** member of the organizing committee of the Hausdorff Institute Workshop "Algebraic Quantum Field Theory and Local Symmetries", Bonn, Germany.
- 2009 **10-18 January** Participation in organizing an exhibition: *LHC, how does it work?*
- 2006 **13-20 May** Participation in organizing the Science Festival in Cracow.
- 2006 **24-25 March** Participation in organizing the Open Days of the Cracow Jagiellonian University.

### Memberships

- since 2012 member of the IAMP (International Association of Mathematical Physics)
- since 2011 reviewer in Mathematical Reviews<sup>®</sup> (MathSciNet<sup>®</sup>)
- since 2011 member of Deutsche Physikalische Gesellschaft (The Association of German Physicists)

### Studies abroad

- 2009 **Summer student**, LPNHE, Universités Paris VI et Paris VII, Paris.
- 2008 **Summer student**, CERN, Geneva.
- 2007-2008 **ERAZMUS**, Georg-August Universität Göttingen, Germany.

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## SCIENTIFIC INTERESTS

- Mathematical structures in Quantum Field Theory (in particular in the algebraic framework)
- Mathematics of renormalization
- Quantum gravity
- Operator algebras
- Noncommutative geometry
- Calculus on locally convex vector spaces and infinite dimensional differential geometry