ALESSANDRO TORRIELLI

Personal data

Dr Alessandro Torrielli, Italian Born March 30, 1975

Address: Mathematics Department, University of Surrey, Guildford, GU2 7XH, UK

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Education and career

As of 01/08/2022	Professor of Mathematics, Surrey
2018-2022	Reader in Mathematics, Surrey
2017	Abilitation to Full Professor (*Professore di Prima Fascia*) according to Italian *Abilitazione Scientifica Nazionale* - Scientific Area FIS-02
2016-2018	Senior Lecturer in Mathematics, Surrey
2011-2016	Lecturer in Mathematics, University of Surrey, UK
2010-2011	Post-doc at the Maths Dept of the University of York, UK (EPSRC grant of Dr N. MacKay and Prof E. Sklyanin)
2008-2010	Post-doc at the Institute for Theoretical Physics and Spinoza Institute Utrecht University, The Netherlands
2006-2008	*Bruno Rossi* INFN-MIT post-doctoral fellow at the Massachusetts Institute of Technology, USA
2004-2006	Post-doc at the Humboldt University (HU Berlin)
2003-2004	Post-doc at the University of Padua and fellow of the Italian Institute for Nuclear Physics (INFN)
2002-2003	Four months of scientific collaboration with Padua
2003	PhD dissertation (Physics), Padua, Italy [17 Feb]
1999	*Laurea 110/110 cum laude* (Physics), Univ. of Genoa, Italy [13 Oct]
1994	*Maturità 60/60*, *Liceo Classico "Parodi"*, Acqui Terme, Italy

Teaching

2015-2020	Designed and taught **Relativistic Quantum Mechanics**, Surrey
2012-2021	Designed and taught **Quantum Mechanics**, Surrey *[students' feedback at the end →]*

2011 Teaching assistant, **Differential Equations**, York

2011 Teaching assistant, **Vector Calculus II**, York
[students' feedback at the end →]

2010 Teaching assistant, **Vector Calculus I**, York
[students' feedback at the end →]

2003 Teaching assistant, **Physics** for 1st year Molecular Biologists, Padua

Supervision

• Supervised a MOST MSc scholar (Chiara Paletta - University of Calabria) in exchange with Surrey - March-July 2019

• External Examiner of 5 PhD vivas (J. Felix, King's Coll. - superv. N. Drukker; Jeroen van Gorsel, Swansea - superv. Carlos Nunez; David Grabner, King's Coll. - superv. N. Gromov; Siphesihle H. Dlamini, Pretoria - superv. Konstantinos Zoubos; Christopher Lewis-Brown, Queen Mary - superv. Sanjaye Ramgoolam)

• Internal examiner of 1 viva (Lorenzo Raspollini - Surrey) and chair of two viva (Roberto Sisca and Michael Foskett - Surrey)

• Supervised 2 and co-supervised 2 MMath projects; supervised 3 BSc project; supervised 1 MSc project

• Supervised 1 and co-supervised 1 *Nuffield Research Placement* projects

• Member of the thesis committee of C. Paletta (PhD student, Trinity Coll., Dublin)

• I closely followed the preparation of the following theses:

- *Andrea Fontanella*

(PhD, Surrey, 2018, supervisor Dr J. Gutowski).

First postdoc at Autonoma Madrid and second postdoc at HU Berlin.

- *Antonio Pittelli*

(PhD, Surrey, 2016, supervisor A. T., co-supervisor Dr M. Wolf).

First postdoc at the University of Uppsala.

- *Marius de Leeuw*

(PhD, Utrecht, 2010, supervisor Prof Dr B. de Wit, co-supervisor Prof Dr G. Arutyunov). *Cum laude* honors (awarded only to outstanding work). First post-doc at AEI, Golm

- *Fabian Spill*

(Master, HU Berlin, 2007, supervisor Prof Dr J. Plefka).

Thesis awarded with the *Humboldt price*, HU Berlin, 2007. PhD at Imperial College.

- *Roberto Valandro*

(Master, Padua, 2003, supervisor Prof A. Bassetto). PhD at SISSA, Trieste.

- *Chiara Paletta*

(Master, Cosenza - Surrey (MOST), 2019, supervisor Prof. M. Rossi). PhD at Trinity College Dublin.

Reference Letters

I write academic reference letters for:

Fabian Spill [see above]
Vidas Regelskis [Surrey] 2011 K. M. Stott Memorial Prize for PhD at York
Alessio Camobreco [Parma and Surrey]
Marius de Leeuw [see above]
Fabrizio Nieri [Surrey] → Uppsala
Andrea Prinsloo [Surrey] → Surrey Teaching Fellow
Georgios Itsios [Santiago] → Oviedo
Konstantinos Siampos [Bern] → fellow at CERN
Paul Skerritt [Surrey] → Surrey Teaching Fellow
Michael Abbott [Cape Town] → Wigner Fellow in Budapest
Antonio Pittelli [see above]
Sylvain Lacroix [ENS-Lyon and Hertfordshire] → Hamburg
Reimar Hecht [ETH Zürich]
Andrea Fontanella [see above] → Lomonosov Institute Moscow
Andrea Dei [ETH Zürich] → Harvard
Nat Levine [Imperial] → ENS Paris
Ana Retore [Trinity College Dublin]
Juan Miguel Nieto García [Surrey]
Anton Pribytok [Trinity College Dublin]

Sanefumi Moriyama [Nagoya] (professorial) → professor at Osaka
George Jorjadze [Tbilisi State University] (professorial) → Fulbright Scholarship

List of Publications **Regular Articles**

1. A. Bassetto, G. Nardelli and A. Torrielli, *"Perturbative Wilson loop in two-dimensional non-commutative Yang-Mills theory"* Nucl. Phys. B 617 (2001) 308

2. A. Bassetto, G. Nardelli and A. Torrielli, *"Scaling properties of the perturbative Wilson loop in two-dimensional non-commutative Yang-Mills theory"* Phys. Rev. D 66 (2002) 085012

3. A. Torrielli, *"Cutting rules and perturbative unitarity of noncommutative electric-type field theories from string theory"* Phys. Rev. D 67 (2003) 086010

4. H. Dorn and A. Torrielli, *"Loop equation in two-dimensional noncommutative Yang-Mills theory"* JHEP 0401 (2004) 026

5. A. Bassetto, A. Torrielli and R. Valandro, *"One-loop unitarity of string theories in a constant external background and their Seiberg-Witten limit"* JHEP 0401 (2004) 040

6. L. Fortunato and A. Torrielli, *"Theory of light emission in sonoluminescence based upon transitions in confined atoms"* Eur. Phys. J. D 33, 315-322 (2005).
[**Featured in the Italian Wikipedia:** *http://it.wikipedia.org/wiki/Sonoluminescenza*]

7. A. Bassetto, G. De Pol, A. Torrielli and F. Vian, *"On the invariance under area preserving diffeomorphisms of noncommutative Yang-Mills theory in two dimensions"* JHEP 0505 (2005) 061

8. C. Sieg and A. Torrielli, *"Wrapping interactions and the genus expansion of the 2-point function of composite operators"* Nucl. Phys. B 723 (2005) 3

9. H. Dorn, M. Salizzoni and A. Torrielli, *"D-branes in overcritical electric fields"* Phys. Rev. D 73 (2006) 026006

10. M. Salizzoni, A. Torrielli and H. S. Yang, *"ALE spaces from noncommutative U(1) instantons via exact Seiberg-Witten map"* Phys. Lett. B 634 (2006) 427-433

11. J. Plefka, F. Spill and A. Torrielli, *"On the Hopf algebra structure of the AdS/CFT S-matrix"* Phys. Rev. D 74 (2006) 066008

12. A. Torrielli, *"Classical r-matrix of the su(2|2) SYM spin-chain"* Phys. Rev. D 75 (2007) 105020

13. S. de Haro, S. Ramgoolam and A. Torrielli, *"Large N expansion of q-deformed two-dimensional Yang-Mills theory and Hecke algebras"* Commun. Math. Phys. 273 (2007) 317

14. S. Moriyama and A. Torrielli, *"A Yangian double for the AdS/CFT classical r-matrix"* JHEP 0706 (2007) 083

15. W. Bietenholz, A. Bigarini and A. Torrielli, *"Area-preserving diffeomorphisms in gauge theory on a non-commutative plane: a lattice study"* JHEP 08 (2007) 041

16. T. Matsumoto, S. Moriyama and A. Torrielli, *"A Secret Symmetry of the AdS/CFT S-matrix"* JHEP 0709 (2007) 099

17. I. Heckenberger, F. Spill, A. Torrielli and H. Yamane, *"Drinfeld second realization of the quantum affine superalgebras of $D^{(1)}(2,1;x)$ via the Weyl groupoid"* RIMS Kokyuroku Bessatsu B8 (2008) 171

18. A. Torrielli, *"Structure of the string R-matrix"* J. Phys. A 42 (2009) 055204

19. F. Spill and A. Torrielli, *"On Drinfeld's second realization of the AdS/CFT su(2|2) Yangian"* J. Geom. Phys. 59 (2009) 489

20. G. Arutyunov, M. de Leeuw and A. Torrielli, *"The Bound State S-Matrix for AdS5 x S5 Superstring"* Nucl. Phys. B 819 (2009) 319

21. G. Arutyunov, M. de Leeuw and A. Torrielli, *"Universal blocks of the AdS/CFT Scattering Matrix"* JHEP 0905 (2009) 086

22. G. Arutyunov, M. de Leeuw, R. Suzuki and A. Torrielli, *"Bound State Transfer Matrix for AdS5 x S5 Superstring"* JHEP 0910 (2009) 025

23. G. Arutyunov, M. de Leeuw and A. Torrielli, *"On Yangian and Long Representations of the Centrally Extended su(2|2) Superalgebra"* JHEP 1006 (2010) 033

24. C. Schubert and A. Torrielli, *"Open string pair creation from worldsheet instantons"* J. Phys. A 43 (2010) 402003 (Fast Track Communication)
[In J. Phys. A "Highlights of 2010" collection]

25. M. de Leeuw, V. Regelskis and A. Torrielli, *"The Quantum Affine Origin of the AdS/CFT Secret Symmetry"* J. Phys. A 45 (2012) 175202

26. A. Babichenko and A. Torrielli, *"Multi-parametric R-matrix for the sl(2|1) Yangian"* J. Math. Phys. 53 (2012) 082302

27. O. Ohlsson-Sax, B. Stefański and A. Torrielli, *"On the massless modes of the AdS_3/CFT_2 integrable systems,"* JHEP 1303 (2013) 109

28. R. Borsato, O. Ohlsson-Sax, A. Sfondrini, B. Stefański, jr. and A. Torrielli, *"The all-loop integrable spin-chain for strings on $AdS_3 \times S^3 \times T^4$: the massive sector,"* JHEP 1308 (2013) 043

29. R. Borsato, O. O. Sax, A. Sfondrini, B. Stefański, jr. and A. Torrielli, *"Dressing phases of AdS_3/CFT_2,"* Phys. Rev. D 88 (2013) 066004

30. G. Itsios, K. Sfetsos, K. Siampos and A. Torrielli, *"The classical Yang-Baxter equation and the associated Yangian symmetry of gauged WZW-type theories,"* Nucl. Phys. B 889 (2014) 64

31. A. Pittelli, A. Torrielli and M. Wolf, *"Secret Symmetries of Type IIB Superstring Theory on $AdS_3 \times S_3 \times M^4$,"* J. Phys. A 47 (2014) 455402
[In J. Phys. A "Highlights of 2014" collection]

32. B. Hoare, A. Pittelli and A. Torrielli, *"S-matrix for the massive and massless modes of the $AdS_2 \times S^2$ superstring,"* JHEP 1411 (2014) 051

33. F. Nieri, S. Pasquetti, F. Passerini and A. Torrielli, *"5D partition functions, q-Virasoro systems and integrable spin-chains,"* JHEP 1412 (2014) 040

34. A. Rolph and A. Torrielli, *"Drinfeld basis for string-inspired Baxter operators,"* Phys. Rev. D 91 (2015) 066004

35. A. Prinsloo, V. Regelskis and A. Torrielli, *"Integrable open spin-chains in AdS_3/CFT_2,"* Phys. Rev. D 92 (2015) 106006

36. B. Hoare, A. Pittelli and A. Torrielli, *"S-matrix algebra of the $AdS_2 \times S^2$ superstring,"* Phys. Rev. D 93 (2016) 066006

37. A. Fontanella and A. Torrielli, *"Massless sector of AdS_3 superstrings: a geometric interpretation,"* Phys. Rev. D **94** (2016) 066008

38. J. Strömwall and A. Torrielli, *"AdS_3/CFT_2 and q-Poincaré superalgebras,"* J. Phys. A **49** (2016) 435402

39. R. Borsato, O. Ohlsson Sax, A. Sfondrini, B. Stefański, jr. and A. Torrielli, *"On the Dressing Factors, Bethe Equations and Yangian Symmetry of Strings on $AdS_3 \times S^3 \times T^4$,"* J. Phys. A **50** (2017) 024004
[**In J. Phys. A "Highlights of 2017" collection**]

40. M. Baggio, O. Ohlsson Sax, A. Sfondrini, B. Stefanski and A. Torrielli, *Protected string spectrum in AdS3/CFT2 from worldsheet integrability,"* JHEP 1704 (2017) 091

41. K. K. Kozlowski, E. Sklyanin and A. Torrielli, *"Quantisation of Kadomtsev-Petviashvili equation,"* Theoretical and Mathematical Physics, 192 (2017) 1162 - Russian version: Teoreticheskaya i Matematicheskaya Fizika, 192 (2017) 259

42. A. Fontanella and A. Torrielli, *"Massless AdS_2 scattering and Bethe ansatz,"* JHEP **1709** (2017) 075

43. A. Torrielli, *"On AdS_2/CFT_1 transfer matrices, Bethe ansatz and scale invariance,"* J. Phys. A **51** (2017) 015402

44. R. Borsato and A. Torrielli, *"q-Poincaré supersymmetry in AdS_5/CFT_4,"* Nucl. Phys. B **928** (2018) 321

45. R. Borsato, J. Strömwall and A. Torrielli, "q-Poincaré invariance of the AdS_3/CFT_2 R-matrix," Phys. Rev. D **97** (2018) 066001

46. D. Bombardelli, B. Stefański and A. Torrielli, "The low-energy limit of $\mathrm{AdS}_3/\mathrm{CFT}_2$ and its TBA," JHEP **10** (2018) 177

47. A. Fontanella and A. Torrielli, *"Geometry of Massless Scattering in Integrable Superstring,"* JHEP **06** (2019) 116

48. A. Fontanella, O. Ohlsson Sax, B. Stefański, Jr. and A. Torrielli, *"The Effectiveness of Relativistic Invariance in AdS_3,"* JHEP **1907** (2019) 105

49. J. M. Nieto García and A. Torrielli, *"Norms and scalar products for AdS_3",* J. Phys. A **53** (2020), 145401

50. J. M. Nieto García, A. Torrielli and L. Wyss, *"Boost generator in AdS_3 integrable superstrings for general braiding",'* JHEP **07** (2020) 223

51. M. de Leeuw, C. Paletta, A. Pribytok, A. L. Retore and A. Torrielli, *"Free Fermions, vertex Hamiltonians, and lower-dimensional AdS/CFT,"* JHEP **02** (2021) 191

52. J. M. Nieto. García, A. Torrielli and L. Wyss, *"Boosts superalgebras based on centrally-extended $\mathfrak{su}(1|1)^2$,"* Journal of Geometry and Physics **164** (2021) 104172

53. S. Majumder, O. Ohlsson Sax, B. Stefański and A. Torrielli, *"Protected states in AdS_3 backgrounds from integrability,"* J. Phys. A: Math. Theor. **54** (2021) 415401

54. A. Cavaglià, N. Gromov, B. Stefański, Jr. and A. Torrielli, *"Quantum Spectral Curve for AdS_3/CFT_2: a proposal,"* JHEP **12** (2021) 048

55. A. Torrielli, *"A study of integrable form factors in massless relativistic AdS_3,"* J. Phys. A: Math. Theor. **55** (2022) 175401

Proceedings

1. A. Torrielli, *"Unitarity of noncommutative field theories from string theory",* proceedings of the "Conference on Spacetime and Fundamental Interactions: Quantum Aspects (In honor of A.P. Balachandran's 65th Birthday)", Vietri, Italy, 2003. Mod. Phys. Lett. A 18 (2003) 2525

2. A. Torrielli, *"D-branes and Unitarity of Noncommutative Field Theories",* in "Proceedings to the Euroconference on Symmetries Beyond the Standard Model", Portoroz, Slovenia, July 12-17, 2003 Bled Workshops in Physics Vol. 4, No. 2-3, DMFA Ljubljana, December 2003

3. A. Bassetto, G. De Pol, A. Torrielli and F. Vian, *"Area preserving diffeomorphisms and Yang-Mills theory in two noncommutative dimensions"* Nucl. Phys. Proc. Suppl. 161 (2006) 21. Also in *Cairns 2005, Light-cone QCD and nonperturbative hadron physics* 21-26

4. W. Bietenholz, A. Bigarini, J. Nishimura, Y. Susaki, A. Torrielli and J. Volkholz, *"Simulation Results for U(1) Gauge Theory on Non-Commutative Spaces"* PoS LATTICE2007 049 (2007)

5. T. Matsumoto, S. Moriyama and A. Torrielli, *"A Secret Symmetry of the AdS/CFT S-matrix"* Int. J. Mod. Phys. A 23 (2008) 2262. Proceedings of the "Workshop On Progress Of String Theory And Quantum Field Theory", 2007, Osaka, Japan

6. A. Torrielli, *"The Hopf superalgebra of AdS/CFT"* J. Geom. Phys. 61 (2011) 230. Proceedings to the workshop "The Interface of Integrability and Quantization" (Leiden, The Netherlands, April 2010)

7. M. de Leeuw, T. Matsumoto, S. Moriyama, V. Regelskis and A. Torrielli, *"Secret Symmetries in AdS/CFT"* Physica Scripta 86 (2012) 028502. Proceedings to the Nordita program 'Exact Results in Gauge-String Dualities', Stockholm, Jan-Feb 2012
[**In Physica Scripta "Highlights of 2012" collection**]

8. A. Torrielli, *"Secret Symmetries of AdS/CFT"* Proceedings of Symposia in Pure Mathematics 90 (2015). Proceedings to "String-Math" 2012, Eds Donagi, Katz, Klemm and Morrison

Invited Reviews

1. A. Torrielli, *"Yangians, S-matrices and AdS/CFT "* J. Phys. A: Math. Theor. 44 (2011) 263001 (Invited topical review)

[**Within top 3 % of most downloaded articles across all IOP journals in 2011**]

2.a N. Beisert *et al.*, *"Review of AdS/CFT Integrability: An Overview"* Lett. Math. Phys. 99 (2012) 3

2.b A. Torrielli, *"Review of AdS/CFT Integrability, Chapter VI.2: Yangian Algebra"* Lett. Math. Phys. 99 (2012) 547

3.a D. Bombardelli, A. Torrielli *et al.*, *"An Integrability Primer for the Gauge-Gravity Correspondence: an Introduction,"* J. Phys. A 49 (2016) 320301
[**In J. Phys. A "Highlights of 2016" collection**]

3.b A. Torrielli, *"Lectures on Classical Integrability,"* J. Phys. A 49 (2016) 323001 (Prepared for the "Durham Young Researchers Integrability School, Special Issue".)

Chapters in Collective Volumes

1. A. Torrielli, *"On the mathematical problem of the relation between string and field theory unitarity singularities through the example of noncommutative field theories"* In Kovras, O. (ed.): Focus on quantum field theory* 83, Nova Science Publ. 2005

Preprints

A. Fontanella, J. M. N. García and A. Torrielli, *"Light-Cone Gauge in Non-Relativistic $AdS_5 \times S^5$ String Theory,"* [arXiv:2102.00008 [hep-th]].

A. Torrielli, *"On factorising twists in AdS_3 and AdS_2,"* [arXiv:2203.15367 [hep-th]].

Theses

1. *Laurea* thesis: *"Riduzione Abeliana e Orizzonti di Gribov in una teoria di Yang e Mills"* (in Italian). Supervisor Prof C. Becchi, co-supervisor Dr N. Maggiore.

2. PhD thesis: *"Noncommutative perturbative quantum field theory: Wilson loop in two-dimensional Yang-Mills, and unitarity from string theory"*, [arXiv:hep-th/0301091]. Supervisor Prof Bassetto, collaborator Dr G. Nardelli.
[**Listed as review at** *http://www.stringwiki.org/wiki/Noncommutativity*]

Refereeing Work

- **$\longrightarrow$ for Journals, Editors**

  Mathematical Reviews (AMS) (2002-2004), *Communications in Mathematical Physics* (since 2007), *Letters in Mathematical Physics* (since 2010), *Journal of High Energy Physics* (since 2005), *Nuclear Physics B* (since 2011), *Annals of Physics* (since 2012), *Journal of Physics A* (since 2013), *Physics Letters B* (since 2014), *Elsevier* book publisher (since 2015), *Journal of Mathematical Physics* (since 2015), *Institute of Physics* book publisher (since 2018)

- $\longrightarrow$ **for Research Councils**

  EPSRC, UK (3 fellowship proposals)

  Shota Rustaveli National Science Foundation, Georgia (1 proposal)

  Czech Science Foundation (2 proposals)

  National Research Foundation (NRF), South Africa (2 proposals)

  Swiss National Science Foundation, Switzerland (1 proposal)

- $\longrightarrow$ **for Other**

  London Mathematical Society (2 summer bursary proposals)

- $\longrightarrow$ **Validation Panel**

  Member of the validation panel for the MSc in Astrophysics and Theoretical Physics at Hertfordshire University (2021)

Organisational experience

Co-organiser together with M. de Leeuw of the Hamilton Mathematical Institute workshop *Integrability in lower dimensional AdS/CFT* (online), August 2021

Panel member for the admission exams to the Milan-Bicocca doctoral school in Physics - entry rounds 2020 and 2021.

Surrey member (together with M. Wolf) of the Physics PhD council of Milano Bicocca for the dual PhD degree

On the supervisory committee for the *Bicocca-Surrey School* on *Prospects in Strings, Fields and Related Topics*, Milano, September 2018

Scientific supervisor (with Dr J. Gutowski) for the *String Geometry, Supersymmetric Theories and Dualities* conference $\rightarrow$ Summer 2017, Surrey

Co-organiser (with *Dr Prinsloo*) of *"SEMPS"* at Surrey, 2015, 2018 and 2022 editions

Co-organiser (with *Dr Regelskis* and *Dr Pasquetti*) of the international conference *"New Trends in Quantum Integrability"*, 18-22 August 2014

Co-organiser of the *"Tomorrow's Mathematicians Today"* (TMT 2014) UK national undergraduate conference. Fundraised £1,500 from private companies to support it

Surrey Maths Summer-project coordinator 2012-14 and 2017 - present

Co-organiser of the Mathematical Physics group seminar, Surrey, 2011-12

Co-organiser of the String Seminar - Institute for Theoretical Physics, Utrecht, 2009

Grants

2018 EPSRC-SFI grant *"Solving spins and strings"* jointly with Dr Marius de Leeuw (Trinity College Dublin). The total value to Surrey is £487,604 (with a commensurate amount from SFI to Trinity College). It includes money for a postdoc, travel, and 20% time for the PI. The project starts in September 2019 and runs for 3 years.

2017 £2,500 EPSRC Vacation Bursary (decl.) and £1,440 LMS Summer Scolarship (accept.) to fund student co-applicant *Mr. Wookyung Kim*

2016 €64,000 (Assoc. di Fondaz. e di Casse di Risp. *via* INFN) with *Prof de Boer* [UvA], *Dr Borsato* [Imperial], *Prof Gaberdiel* [ETH], *Dr Ohlsson Sax* [Nordita], *Dr Sfondrini* [ETH], *Dr Stefanski* [City], *Prof Tong* [DAMTP]: *Giovani ricercatori in Fisica Teorica: AdS_3/CFT_2* - young researcher participation to GGI workshop (see below)

2015 Approx. €100,000 (Galileo Galilei Institute - GGI workshop) with *Prof de Boer* [UvA], *Dr Borsato* [Imperial], *Prof Gaberdiel* [ETH], *Dr Ohlsson Sax* [Nordita], *Dr Sfondrini* [ETH], *Dr Stefanski* [City], *Prof Tong* [DAMTP]: *New Developments in AdS_3/CFT_2 Holography*

2013 £271,118.37 (STFC *Consolidated Grant*) jointly with the Surrey *Fields, Strings and Geometry* group (PI Prof. Sfetsos; deputy A.T.)

£1,500$\times n$ (London Mathematical Society - LMS) as Surrey node-leader to hold the *"South East Mathematical Physics Seminars"* (SEMPS) (initial, renewed periodically)

£800 (LMS *Small Education Grant*) to sponsor TMT 2014

£2,500 EPSRC Vacation Bursary to fund student co-applicant *Mr. James Goodwin* on a 10-week Summer project

Sponsored *Dr. Regelskis*' £271,911 EPSRC fellowship to join Surrey

2012 £2,880 in LMS-Nuffield Undergraduate Research Bursaries. One project presented at TMT '13, Greenwich, UK

€13,500 *Dr Camobreco*'s *Della Riccia* Fellowship to join Surrey

£97,336 Individual EPSRC *First grant* (2 years): *"Exotic quantum groups, Lie superalgebras and integrable systems"*

2003 Two-month DAAD (German Academic Exchange) grant at HU Berlin

Other awards

2015 Best lecturer: Durham *YRIS school*. Award presented at IGST15.

2007 1-week visiting fellow at the Isaac Newton Institute, Cambridge, UK

2002	Robert Hofstadter Award at the *"40th International School of Subnuclear Physics"*, Erice, Italy (new-talents' talk session)
1995-2000	Five times winner of scholarship for children of workers, Alessandria
1995-1996	Twice sole recipient of Genoa U. Physics-students' scholarship
1993	Sole Acqui Terme student sent to summer-school at Scuola Normale

Memberships

Member of LMS since June 2013

Fellow of Higher Education Academy since 2013

Invited Speaker at Group Seminars

2002	University of Genoa
2004	University of Padua
2005	AEI Golm
2007	Brown University, Providence, RI, USA
	University of Padua
	University of Bologna, Italy
	Universidad Michoacana, Morelia, Mexico
2008	Maths Dept of MIT, Cambridge, MA, USA
	HU Berlin
2009	NIKHEF Theory Group seminar, Amsterdam (Netherlands)
	Vienna University of Technology - ITP, Vienna, Austria
	University of Amsterdam, String Theory Group seminar
	CERN Theory Group (Geneva-Switzerland), String seminar
2010	LAPTH, Annecy-le-Vieux, France
	Imperial College (London), String Theory seminar
	University of Genoa
	University of Bologna
2011	University of Uppsala, Sweden
	University of Oxford, UK
	University of Padua
	Series of lectures at the University of Parma (5 hours).
2012	School of Maths, Trinity College Dublin, Ireland
	Queen Mary University of London, UK - String Theory seminar
	Utrecht - String Theory seminar
	HU Berlin
2013	York - Mathematical Physics seminar

	University of Bologna
2014	Durham - HEP lunchtime seminar
	Edinburgh Mathematical Physics Group (EMPG) seminar
	University of Bologna
2015	University of Genoa
	University of Turin
2016	University of Modena
	City University, London
	Polygon seminar, Queen Mary University of London
	Strings, CFT and Integrability seminar, ETH, Zürich, Switzerland
	University of Parma, Italy
2019	Theoretical Physics Wednesday Seminar, Uppsala, Sweden
	Theoretical Physics Seminar, Trinity College, Dublin
	University of Cosenza, Italy
	University of York Mathematical Physics Seminar, UK
2020	University of Southampton String Theory Group Seminar, UK
2021	Emmy Noether Seminar, University of Leipzig, Germany
	University of Cosenza, Italy
	String Theory group seminar, Trinity College Dublin, Ireland

Journal Clubs:

- 3 Padua Journal Clubs
- 1 HU Berlin QFT Seminar
- 2 MIT Student Lunch Clubs
- 1 MIT String Seminar
- 2 at Utrecht (GraFiTi, String Seminar)
- Mini-series of 3 York Mathematical-Physics Seminars
- Mini-series of 10 lectures at Surrey Maths Dept, plus 1 seminar and 1 colloquium
- 4 Surrey Journal Clubs - 1 Surrey *Fields, Strings and Geometry* seminar
- String Theory Journal Club at City University
- Journal Club, ETH - Zürich, Switzerland
- London Integrability Journal Club, King's College (opening seminar)
- Topological Quantum Field Theory Journal Club, Queen Mary, London

Invited Speaker at Conferences

2003 *Problemi attuali di Fisica Teorica*, Vietri, Italy

2006 *Problemi attuali di Fisica Teorica*, Vietri

2007 Isaac Newton Institute Programme *Strong Fields, Integrability and String*, Cambridge, UK

2009 *Integrability in Gauge and String Theory* '09, Max Planck Institut and Albert Einstein Institut, Golm, Germany (invited review talk)

2010 *North British Mathematical Physics Seminar* (opening talk) Dept of Mathematical Sciences, Durham, UK

2012 Nordita Programme *Exact Results in Gauge-String Dualities* Nordita, Stockholm, Sweden

Invited to moderate a discussion on *Current status of AdS/CFT integrability* (with O. Ohlsson-Sax and N. Gromov), *Maths of String and Gauge Theory workshop*, City U. and King's College, London, UK

Invited **plenary** speaker to *String-Math* 2012, Bonn, Germany

Integrability in Gauge and String Theory '12, ETH-Zürich, Switzerland

2013 *4th Johannesburg Workshop on String Theory*, South Africa

IX Avogadro meeting, review session (with A. Sfondrini), Trieste

2014 *Permutations and Gauge-String Duality 2014*, Queen Mary U., London

Third AGM Meeting on Geometric Quantum Dynamics, Brunel University, London

2015 η *and* λ *Deformations in Integrable Systems and Supergravity*, Albert Einstein Institute, Bern, Switzerland

Invited opening lecture series (5 hours), *YRIS school*, Durham

Plenary talk at the conference *Selected topics in theoretical high energy physics*, Tbilisi, Georgia, September 21-27

2016 *Integrability in Gauge and String Theory* 2016, Humboldt University Berlin, Germany

2017 21st UK Meeting on *Integrable Models, Conformal Field Theory and Related Topics* (ICFT 2017), Leeds

South-East Mathematical Physics Seminar - SEMPS University of Kent - Canterbury, UK

2018 4 hours of lectures on integrability at the *Bicocca-Surrey School* on *Prospects in Strings, Fields and Related Topics*, Milano, September 2018

2019 10 hours of lectures on Classical and Quantum integrability, PhD course, Santiago de Compostela, Spain - website at: *https://indico.cern.ch/event/828305/*

2020 Invited talk at the Integrability, Dualities and Deformations seminar series, *https://sites.google.com/view/intdualdef*

2022 Invited talk at Integrability, Dualities and Deformations, Berlin

Invited Colloquia

2013 ITF and Spinoza Institute Colloquium, Utrecht

2020 IIT Roorkee Virtual Meeting on Gravity, Strings, and Fields

2022 Centre for Particle Theory virtual Colloquium, Durham University

Other Conference Talks/Posters

2001 International Light-Cone Workshop *Light-cone Physics: Particles and Strings*, ECT* Trento, Italy (poster)

2002 EURESCO Conf. *Particle Physics and Gravitation*, Bad Herrenalb (DE)

2003 *Convegno Informale di Fisica Teorica*, Cortona, Italy

What comes beyond the Standard Model?, EURESCO conference, Portoroz, Slovenia (poster)

2004 *Spacetime and Fundamental Interactions: Quantum Aspects - A conference to honor A. P. Balachandran's 65th birthday*, Vietri, Italy

Convegno Informale di Fisica Teorica, Cortona, Italy

2006 XVIII Workshop *Beyond the Standard Model*, Bad Honnef, Germany

Integrability in Supersymmetric Gauge- and String Theory, Niels Bohr Summer Institute "Frontiers in Theoretical Particle Physics", NBI Copenhagen, Denmark

2010 *The Interface of Integrability and Quantization*, Lorentz Center, Leiden, The Netherlands

Computing

Fortran (long time ago), LaTeX, Mathematica.

Students' Feedback for the 2010 Autumn Term Seminar - Vector Calculus I, York (as received)

A very helpful seminar leader; he explained things well; he was very nice and went out of his way to be useful and supportive.

Very helpful seminars, methods often seemed different to notes but very well organised

Thoroughly enjoyed these seminars. Covered a lot of material and questions which was very helpful. Explains topics very clearly, and uses real/fun examples to help convey a new topic.

Students' Feedback for the 2011 Spring Term Seminar - Vector Calculus II, York (as received)

Very good. Enthusiastic and explained problems clearly.

Alessandro's seminars have been well worth attending as he manages to explain all of the lecture material in an incredibly easy way to understand. I hope that I have the opportunity to attend more of Alessandro's seminars in the future.

Extract from sudents' Feedback for Quantum Mechanics MAT3039, Surrey 2012-13 (as received)

- *This was my best lecture of the semester - Dr Torrielli is incredibly enthusiastic and knowledgable on the course material. and gives engaging lectures. - Dr Torrielli was very responsive to student feedback over the duration of the course. producing very well-written. comprehensive lecture notes. a glossary and exercises. He clearly cares a lot that the students are enjoying the course and performing well (for example. by giving individual feedback to us after the class test). - Giving lectures on extra non-examinable material purely for background purposes was motivating and a welcome change (it is often easy to become completely exam-focused).*

- *The teaching was very good. Alessandro is an excellent lecturer. Class examples were all relevant and clear. The online notes Alessandro provided were very good. he kept adding to them every week with what we had learnt in the lectures. It was nice to have a lecturer that is passionate and enthusiastic about what he teaches. He would always ask to make sure we understood and was very approachable if we needed help with things. He goes the extra mile to make it a good learning experience. Alessandro Torrielli is the best lecturer I've had at Surrey. and because of this I really enjoyed Quantum Mechanics.*

- *This lecturer is one of the best I've had, not necessarily due to lecturing style, but the fact that I feel he genuinely cares about how well I do and whether I understand or not, and he is very passionate about the subject which makes lectures more enjoyable. Dr Torrielli is always available for questions, and has even answered my emails on a Sunday morning before now. His emails aren't just one line answers either, not only are the answer explained but it is expanded upon, and the "folklore"*

of the Maths is discussed. Dr Torrielli also took the time to email each and every one of us some feedback advice after our test, which I felt was a fair test and studying for it helped me to improve my understanding of the topic. Dr Torrielli has taken what is a very difficult topic and made it interesting and entertaining, whilst also caring about us succeeding in our degrees. The notes which go up on Surrey Learn are also incredibly helpful. They don't replace the lectures, but help to consolidate what we have learned. I also really appreciate the colour coding used before tests as it saves so much unnecessary confusion. I wish he had been a lecturer since I started at Surrey!

- *Real subject knowledge. enthusiasm and always being available and approachable with problems.*

Extract from sudents' Feedback for Quantum Mechanics MAT3039, Surrey 2013-14 (as received)

- *The feedback given by the Dr Torrielli was phenomenal. He would have tests marked within 2 days and then he would email each student individually with personal feedback. Extremely enthusiastic about his subject and he found a way to make his classes quite interesting. His were the only lectures I genuinely looked forward to attending.*
- *This module was a pleasure from start to finish. Dr. Torrielli's communication style was clear and informative, and he spoke with a genuine passion for the subject and for our education. Additionally, he was very available to ask questions or go over things that we don't understand. Personalized replies containing out coursework/test marks only hours after completion show dedication to us as students and encouraged me to work even harder. Overall, this has been a fantastic module to take part in.*
- *Dr Torrielli's passion and enthusiasm was incredible - I got a clear sense of his love for the subject of Quantum Mechanics, and his desire for students to share his passion. He is also an incredibly friendly and engaging man on a personal level, more than happy to give up his personal time to help improve student's learning. This is probably the module I have enjoyed most at my time at Surrey*
- *I was very impressed with the amount of help and commitment the lecturer showed while giving the lectures and with extra materaials and resources. I was also impressed with how much the lecturer understood the learning needs of myself, for example that difficulty of the abstact concepts involved and help I recieved in learning them.*
- *Dr Torielli really loves this subject, his enthusiasm comes across strongly and he makes this module an interesting exploration into Physics. Thanks!*

Extract from sudents' Feedback for Quantum Mechanics MAT3039, Surrey 2015-16 (as received)

- *I really really enjoyed the module! The best aspect of it of course was an amazing lecturer Dr Torrielli! He loves his subject and was able to transfer this love to us - students. I really liked the fact that he didn't only talk about examinable stuff, but also he spoke about history of the subject and interesting facts. All the notes were clear. The feedback was amazing. Immediate response to students via emails. Dr Torrielli was always happy to see students and help us if we were struggling. He perfectly knows his subject! I am very very happy that I chose to do it this semester! I would give 10 out of 10 to the module.*

- *This module was fantastic. Dr Torrielli is clearly very passionate about his subject and his enthusiasm was passed on to us. I liked how some parts of the module were unassessed as this gave us the chance to learn something interesting without the pressure of having to understand it for an exam. Lecture notes were well organised and examples and coursework sheets helped with exam questions. I loved the emails with individual feedback on coursework and tests and also Dr Torrielli's willingness to answer questions at any time of day. Dr Torrielli is a fabulous lecturer and I loved this module.*

- *Dr Torrielli is clearly passionate about the subject and this passion made the module so interesting. It has probably been the most difficult module to get my head around but Dr Torrielli has always made it clear that he is available to help. He has always answered my questions after class or in his own time later. He is wonderfully approachable and friendly. He also has amazing memory!*

- *AMAZING! Dr Torrielli is very passionate about Quantum Mechanics and other fields of study mentioned in the course. Alessandro's enthusiasm is infectious which is one of the main reasons people enjoy this module so much! It is refreshing to feel that you are supported so much and always welcomed to discuss topics out of office hours. Also, the feedback following class tests was really helpful and greatly appreciated!*

- *Alessandro's passion, it inspired me to also be passionate about the subject and to try my best perform well in it*

Master student's thesis acknowledgments

- *It is true that passion for a subject is born from a great teacher, and Dr. Torrielli's enthusiasm is infectious*