

Giacomo Marmorini - CV

Affiliazione: Department of Physics and Mathematics, Aoyama Gakuin University
Indirizzo: Fuchinobe 5-10-1, Sagamihara, Kanagawa 252-5258, Giappone
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Istruzione

Perfezionamento (Ph.D.) in Fisica, *Cum Laude*, Dicembre 2007

Scuola Normale Superiore, Pisa

Tesi: Non-Abelian solitons and confinement

Supervisore: Prof. Kenichi Konishi (referente interno: Prof. Riccardo Barbieri)

Laurea Specialistica in Fisica, *Cum Laude*, Ottobre 2003

Università di Pisa

Tesi: Matrix models, generalized Konishi anomalies and effective description of $\mathcal{N} = 1$ supersymmetric gauge theories

Relatore: Prof. Kenichi Konishi

Laurea in Fisica, *Cum Laude*, Marzo 2003

Università di Pisa

Tesi: Minimal Standard Model and extensions with massive neutrino

Relatore: Prof. Kenichi Konishi

Esperienze professionali (accademia)

Giugno 2019 - Marzo 2022. Ricercatore e tutor, Department of Physics, Aoyama Gakuin University

Aprile 2017 - Marzo 2020. Postdoc presso Department of Physics and Research and Education Center for Natural Sciences, Keio University

Ottobre 2015 - Marzo 2017. Docente part-time presso Graduate School of Human and Environmental Studies, Kyoto University

Aprile 2015 - Marzo 2017. Yukawa Fellow (Research Assistant Professor) presso Yukawa Institute for Theoretical Physics, Kyoto University

Marzo 2012 - Febbraio 2015. Foreign Postdoctoral Researcher presso Condensed Matter Theory Lab, The Institute of Physical and Chemical Research (RIKEN)

Aprile 2011 - Febbraio 2012. Postdoc presso Department of Physics, Tokyo University of Science

Marzo 2009 - Settembre 2010. Postdoc presso Department of Physics e Research and Education Center for Natural Sciences, Keio University

Ottobre 2007 - Gennaio 2008. Research Fellow presso School of Mathematics, Trinity College Dublin

Esperienze professionali (altro)

Autunno 2010. Insegnante di Matematica presso Liceo “Giosuè Carducci”, Piombino (LI).

Estate 2008. Insegnante di Matematica presso I.S.I.S “Marco Polo”, Cecina (LI).

Borse di studio e di ricerca, finanziamenti

Finanziamento Mochizuki (Yukawa Memorial Foundation) 2015

Borsa di ricerca Yukawa 2015-2017

RIKEN FPR Fellowship 2012-2015

JSPS Fellowship FY2009

Borsa di ricerca “Della Riccia” 2009

Foreign Graduate Invitation Program (FGIP), Tokyo Institute of Technology, 2006

Borsa di studio della Scuola Normale Superiore (Pisa) 2004-2006

Borsa di studio della Regione Toscana 1998-2003

Pubblicazioni scientifiche

O. Prokhnenko, G. Marmorini, S. E. Nikitin, D. Yamamoto, A. Gazizulina, M. Bartkowiak, A. N. Ponomaryov, S. A. Zvyagin, H. Nojiri, I. F. Díaz-Ortega, L. M. Anovitz, A. I. Kolesnikov, and A. Podlesnyak

“High-field spin-flop state in green diopside”,

Phys. Rev. B **103**, 014427 (2021) [arXiv:2101.08555 [cond-mat]]

D. Yamamoto, C Suzuki, G Marmorini, S Okazaki and N Furukawa

“Quantum and Thermal Phase Transitions of the Triangular SU(3) Heisenberg Model under Magnetic Fields”,

Phys. Rev. Lett. **125**, 057204 (2020) [arXiv:2004.03250 [cond-mat]]

D. Yamamoto, G. Marmorini, M. Tabata, K. Sakakura, and I. Danshita

“Magnetism driven by the interplay of fluctuations and frustration in the easy-axis triangular XXZ model with transverse fields”,

Phys. Rev. B **100**, 140410(R) (2019) [arXiv:1808.08916 [cond-mat]]

D. Yamamoto, H. Ueda, I. Danshita, G. Marmorini, T. Momoi and T. Shimokawa,

“Exact diagonalization and cluster mean-field study of triangular-lattice XXZ antiferromagnets near saturation”,

Phys. Rev. B **96**, 014431 (2017) [arXiv:1704.04024 [cond-mat]]

G. Marmorini, M. Pepe and P. Calabrese,

“One-body reduced density matrix of trapped impenetrable anyons in one dimension”,

J. Stat. Mech. (2016) 073106 [arXiv:1605.00838 [cond-mat]]

G. Marmorini, D. Yamamoto, and I. Danshita,

“Umbrella-coplanar transition in the triangular XXZ model with arbitrary spin”,

Phys. Rev. B **93**, 224402 (2016) [arXiv:1510.07969 [cond-mat]]

D. Yamamoto, G. Marmorini and I. Danshita,

“Magnetization process of spin-1/2 Heisenberg antiferromagnets on a layered triangular

lattice”,

J. Phys. Soc. Jpn. **85**, 024706 (2016) [arXiv:1510.04402 [cond-mat]]

D. Yamamoto, G. Marmorini and I. Danshita,

“Microscopic Model Calculations for the Magnetization Process of Layered Triangular-Lattice Quantum Antiferromagnets”,

Phys. Rev. Lett. **114**, 027201 (2015) [arXiv:1411.4233 [cond-mat]]

featured in RIKEN Research Highlight

R. Yoshii, S. Takada, S. Tsuchiya, G. Marmorini, H. Hayakawa and M. Nitta,

“Fulde-Ferrell-Larkin-Ovchinnikov states in a superconducting ring with magnetic fields: Phase diagram and the first-order phase transitions”,

Phys. Rev. B **92**, 224512 (2015) [arXiv:1404.3519 [cond-mat]]

G. Marmorini and T. Momoi,

“Magnon condensation with finite degeneracy on the triangular lattice”,

Phys. Rev. B **89**, 134425 (2014) [arXiv:1312.5935 [cond-mat]]

D. Yamamoto, G. Marmorini and I. Danshita,

“Quantum Phase Diagram of the Triangular-Lattice XXZ Model in a Magnetic Field”,

Phys. Rev. Lett. **112**, 127203 (2014) [Erratum: Phys. Rev. Lett. **112**, 259901 (2014)] [arXiv:1309.0086 [cond-mat]]

R. Yoshii, G. Marmorini and M. Nitta,

“Spin Imbalance Effect on Josephson Junction and Grey Soliton”,

J. Phys. Soc. Jpn. **81**, 094704 (2012)

Luca Ferretti, Michele Cortelezzi, Bin Yang, Giacomo Marmorini and Ginestra Bianconi,

“Features and heterogeneities in growing network models”,

Phys. Rev. E **85**, 066110 (2012) [arXiv:1111.3652 [physics.soc-ph]]

R. Yoshii, S. Tsuchiya, G. Marmorini and M. Nitta,

“Spin imbalance effect on Larkin-Ovchinnikov-Fulde-Ferrel state”,

Phys. Rev. B **84**, 024503 (2011) [arXiv:1101.1578 [cond-mat]]

T. Fujimori, G. Marmorini, M. Nitta, K. Ohashi and N. Sakai,

“The Moduli Space Metric for Well-Separated Non-Abelian Vortices”,

Phys. Rev. D **82**, 065005 (2010) [arXiv:1002.4580 [hep-th]]

M. Eto, J. Evslin, K. Konishi, G. Marmorini, M. Nitta, K. Ohashi, W. Vinci and N. Yokoi,

“On the moduli space of semilocal strings and lumps”,

Phys. Rev. D **76**, 105002 (2007) [arXiv:0704.2218 [hep-th]]

M. Eto, L. Ferretti, K. Konishi, G. Marmorini, M. Nitta, K. Ohashi, W. Vinci and N. Yokoi,

“Non-Abelian duality from vortex moduli: a dual model of color confinement”,

Nucl. Phys. B **780**, 161 (2007) [arXiv:hep-th/0611313]

M. Eto, K. Hashimoto, G. Marmorini, M. Nitta, K. Ohashi and W. Vinci,

“Universal reconnection of non-Abelian cosmic strings”,
Phys. Rev. Lett. **98**, 091602 (2007) [arXiv:hep-th/0609214]

M. Eto, K. Konishi, G. Marmorini, M. Nitta, K. Ohashi, W. Vinci and N. Yokoi,
“Non-Abelian vortices of higher winding numbers”,
Phys. Rev. D **74**, 065021 (2006) [arXiv:hep-th/0607070]

K. Konishi, G. Marmorini and N. Yokoi,
“Nonabelian confinement near nontrivial conformal vacua”,
Nucl. Phys. B **741**, 180 (2006) [arXiv:hep-th/0511121]

S. Bolognesi, K. Konishi and G. Marmorini,
“Light nonabelian monopoles and generalized r -vacua in supersymmetric gauge theories”,
Nucl. Phys. B **718**, 134 (2005) [arXiv:hep-th/0502004]

Proceedings con peer-review

Y. Miyazaki, D. Yamamoto, G. Marmorini, and N. Furukawa,
“Field-induced phase transitions of tetramer-singlet states in synthetic SU(4) magnets”.
AIP Advances **11**, 025202 (2021)

G. Marmorini, R. Yoshii, S. Tsuchiya and M. Nitta
“Analytic Self-Consistent Condensates in quasi-1D Superfluid Fermi Gases in the Andreev approximation”,
J. Low Temp. Phys. **175**, 420 (2014) - Proceedings (with peer-review) of *The International Conference on Quantum Fluids and Solids QFS2013*, 1 -6 Agosto 2013, Matsue, Japan

Proceedings

S. Bolognesi, K. Konishi and G. Marmorini
“Light nonabelian monopoles: constructing dual nonabelian superconductor of more general types”,
Prog. Theor. Phys. Suppl. **164**, 186 (2006) - Proceedings of the *International Workshop “Frontiers of Quantum Physics”*, 17 - 19 February 2005, Yukawa Institute for Theoretical Physics, Kyoto, Japan

Insegnamenti

Kyoto University (Graduate School of Human and Environmental Studies)
Anno accademico 2015/16. Metodi matematici della fisica - 50 ore.
Anno accademico 2016/17. Metodi matematici della fisica - 50 ore.

Aoyama Gakuin University (Dept. of Physics)
Giugno 2019 - data odierna. Tutor per il lavoro di tesi di studenti di laurea e laurea specialistica. Per referenze contattare Prof. Nobuo Furukawa (furukawa@phys.aoyama.ac.jp) e Prof. Daisuke Yamamoto (d-yamamoto@phys.aoyama.ac.jp)

Altre attività professionali

Referee per Physical Review Letters, Physical Review B, Physical Review E, Scientific Reports.

Partecipazione all’Iniziativa Specifica INFN PI21 e poi PI14 dal 01-01-2004 al 30-06-2007.

Presentazioni orali

“Unconventional phase transitions in $SU(N)$ Heisenberg models under external fields”, Kindai University, online, 28 ottobre 2020.

“Exploring frustration on the triangular lattice: from novel quantum order-by-disorder to BKT physics” Università di Pisa , 6 marzo 2018; Johannes Gutenberg University, Mainz, 19 marzo 2018; Chuo University, Tokyo, 26 luglio 2019.

[Su invito] “On the different kinds of superfluid vortices in the interior of neutron stars”, NORDITA program *Phase Transitions in Astrophysics*, 11 maggio 2017, Stockholm, Sweden

“New results for triangular-lattice quantum antiferromagnets in a magnetic field”, Waseda University, Tokyo, 4 marzo 2016.

“New results for triangular-lattice quantum antiferromagnets in a magnetic field”, *20th International Conference on Magnetism (ICM2015)*, 7 luglio 2015, Barcelona.

“Microscopic modeling of the quantum triangular antiferromagnet $Ba_3CoSb_2O_9$ ”, Yukawa Institute for Theoretical Physics, Kyoto University, 8 aprile 2015.

“New results for quantum antiferromagnets in high magnetic fields”, Yukawa Institute for Theoretical Physics, Kyoto University, 22 maggio 2014, Kyoto, Giappone; Scuola Normale Superiore, 16 luglio 2014, Pisa; Joint SISSA/ICTP Seminars, 21 luglio 2014, Trieste; Université Pierre et Marie Curie, Paris, 18 dicembre 2014.

“High magnetic field phases of the J_1 - J_2 and J_1 - J_3 triangular antiferromagnet”, *JPS Fall Meeting 2013*, 25 settembre 2013, Tokushima, Giappone; APS March meeting, 7 marzo 2014, Denver CO, USA.

“Exact self-consistent condensates in (imbalanced) superfluid Fermi gases”, Department of Physics, Niigata University, 2 settembre 2010, Niigata, Giappone; Yukawa Institute for Theoretical Physics, Kyoto University, 7 settembre 2010, Kyoto, Giappone; APS March meeting, 20 marzo 2013, Baltimore MD, USA.

“An invitation to Topological Quantum Computation”, Keio University, 14 luglio 2009, Yokohama, Giappone.

“On the moduli space of semilocal strings and lumps”, *School “Gauge fields and strings”*, Isaac Newton Institute for Mathematical Sciences, 24 settembre 2007, Cambridge, UK

“Nonabelian vortices of higher winding number”, HEP theory group seminar, University of Tokyo at Hongo, 24 agosto 2006, Tokyo, Giappone; Theory seminar, The Institute of Physical and Chemical Research (RIKEN), 25 agosto 2006, Wako, Giappone

“Nonabelian duality and confinement”, FGIP seminar, Tokyo Institute of Technology, 4 agosto 2006, Tokyo, Giappone

“The moduli space of composite nonabelian vortices”, *XVth Oporto Meeting in Geometry, Topology and Physics “Mathematical aspects of supersymmetry”*, 23 luglio 2006, Porto, Portogallo; Theoretical Particle Physics seminar, Tokyo Institute of Technology, 2 agosto 2006, Tokyo, Giappone

“Light Nonabelian Monopoles and Generalized r-Vacua in Supersymmetric Gauge Theories”, *XXVII Theoretical Physics Meeting*, 26 maggio 2005, Cortona (AR)

Presentazioni con poster

“Mixed dipolar-nematic order and half-vortex topological transitions of the triangular SU(3) Heisenberg model under magnetic fields”, *waiting for the conference on Highly Frustrated Magnetism (wHFM21)*, 26 gennaio 2021, online (organizzata da Max Planck Institute for the Physics of Complex Systems, Dresden, Germany)

“Frustrated Magnetism with Coherently-Coupled Binary Fermi Gases in Triangular Optical Lattices”, *The Fourth Kyoto-Beijing-Tokyo Workshop on Ultracold Atomic Gases*, 1 ottobre 2019, Kyoto, Japan

“Umbrella-coplanar transition in the triangular XXZ model with arbitrary spin”, *Highly Frustrated Magnetism 2016*, 8 settembre 2016, Taipei, Taiwan.

“New results for quantum antiferromagnets in high magnetic fields”, *Higgs Modes in Condensed Matter and Quantum Gases*, Yukawa Institute for Theoretical Physics, Kyoto University, 24 giugno 2014, Kyoto, Giappone

“Magnon condensation with finite degeneracy on the triangular lattice”, *Novel Quantum Materials and Phases (NQMP2014)*, 14 marzo 2014, Okinawa Institute of Technology, Okinawa, Giappone; *Highly Frustrated Magnetism 2014*, 8 luglio 2014, Cambridge, UK

“High magnetic field phases of the J1-J2-J3 triangular antiferromagnet”, *The International Conference on Strongly Correlated Electron Systems SCES2013*, Tokyo University, 6 agosto 2013, Tokyo, Giappone

“High magnetic field phases of the J1-J3 triangular antiferromagnet”, *Physics of Quantum Spin Systems*, Yukawa Institute for Theoretical Physics, Kyoto University, 13 novembre 2012, Kyoto, Giappone

“Exact Self-Consistent Condensates in (Spin-Imbalanced) Fermionic Gases”, *International Conference on Novel Superconductivity in Taiwan 2011 (ICNSCT2011)*, National Cheng Kung University, 6 agosto 2011, Tainan, Taiwan; *International Workshop for Young Researchers on Topological Quantum Phenomena in Condensed Matter with Broken Symmetries*, 1 - 5 novembre 2011, Biwa-ko (Shiga), Giappone; *The International Conference on Quantum Fluids and Solids QFS2013*, 3 agosto 2013, Matsue, Giappone

“Exact self-consistent condensates in (imbalanced) superfluid Fermi gases”, *Ultracold Fermi Gas: Superfluidity and Strong-Correlation (USS-2010)*, CCSE, Japan Atomic Energy Agency, 14 maggio 2010, Tokyo, Giappone.

“Off-diagonal correlations of anyons in one dimension”, *Infinite Analysis 09 - New trends in quantum integrable systems*, Department of Mathematics, Kyoto University, 29 luglio 2009, Kyoto, Giappone

Scuole, conferenze, workshops

Organizzatore del *Topological Science Symposium 2017*, Keio University, 21 - 22 novembre 2017, Yokohama, Japan.

Partecipante in 41 eventi internazionali and 8 domestici.

Visite accademiche

SISSA, Trieste, Dicembre 2014; agosto 2016; marzo 2018

Waseda University, Tokyo, Giappone, aprile 2015; marzo 2016

Institute of Photonic Science (ICFO), Castelldefels, Spagna, giugno 2012

Dipartimento di Fisica, Università di Pisa, maggio 2012

Yukawa Institute for Theoretical Physics, Kyoto University, Kyoto, Giappone, settembre 2010

Institute for the Physics and the Mathematics of the Universe, Tokyo University, Tokyo, Giappone, febbraio 2010

Theoretical Physics Laboratory, The Institute of Physical and Chemical Research (RIKEN), Wako, Giappone - agosto 2006

Department of Physics, Tokyo Institute of Technology, Tokyo, Giappone - luglio/agosto 2006

Physique Théorique et Mathématique, Université Libre de Bruxelles, Bruxelles, Belgio - dicembre 2005; Ottobre 2006.

Altre competenze

- *Lingue*: Italiano (madrelingua), Inglese (fluente), Giapponese (buono), Spagnolo (buono), Francese (basilare),
- *Competenze informatiche*
Sistemi operativi: Mac OS, Linux, Windows
Applicazioni: Microsoft Office, iWork (Keynote), Open Office
Linguaggi di programmazione: L^AT_EX, Mathematica, C, Python