europass

Riccardo Fantoni

Nationality: Italian **Date of birth:** 30/08/1970 **Gender:** Male

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EDUCATION AND TRAINING

Batchelor

Liceo Scientifico Filippo Buonarroti [09/10/1984 – 09/10/1989]

City: Pisa | **Country:** Italy | **Website:** https://www.liceofilippobuonarroti.edu.it/ | **Field(s) of study:** Scientific maturity | **Final grade:** 60/60

Master in Physics

University of Pisa [1989 – 1994]

City: Pisa | **Country:** Italy | **Field(s) of study:** Physics | **Final grade:** 110 cum laude | **Thesis:** Sum Rules in a Layered Electron Gas

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Dipartimento di Fisica di Pisa
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GEO Broglia, Fortuna
ANA I Marino
ANA II Marino

EXP I Martinelli
EXP II Tonelli, Bigi
EXP III Pierazzini, Minguzzi
EXP IV Beverini

PHY I Bellettini, Barsella
PHY II Stoppini
PHY III Menotti, D' Emilio
PHY SUP Bemporad
PHY THEO Di Giacomo, Maggiore, Paffuti, Rossi
PHY STAT Guadagnini
PHY SOL Grosso
PHY STR Arimondo
PHY MECH Servadio
MAT METH Cicogna, Morchio

CHEM Palleschi
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Scuola Normale Superiore di Pisa
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PHY STAT Tosi

PHY MANY BODY Tosi
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Ph.D. in Physics

University of Trieste [2001 – 2004]

City: Trieste | **Country:** Italy | **Field(s) of study:** Physics

1. Computational approach to the structural and electronic properties of solids, Maria Peressi
2. Dynamic phenomena on surfaces, Renzo Rosei
3. Introduction to dynamical systems, Fabio Benatti
4. Introduction to statistical thermodynamics of disordered systems, Giorgio Pastore
5. Magnetic properties of low dimensional systems, Giorgio Rossi

Master in Physics

University of Illinois at Urbana/Champaign [1994 – 2000]

City: Urbana | **Country:** United States | **Field(s) of study:** Physics

ESL 401 Introduction to academic writing
PHYCS 302 Atmospherical Science, Walter Robinson
PHYCS 302 Principles of Atoms Dynamics, Richard Martin
PHYCS 398 Computer Simulation Methods of Many Particle Physics, David Ceperley
PHYCS 402 Theoretical Astrophysics, W. Watson and K. Cundiff
PHYCS 411 Boundary Value Problems in Physics, Yoshi Oono
PHYCS 412 Additional Techniques in Mathematical Physics, Yoshi Oono
PHYCS 413 Complex Variables Physics, Michael Stone
PHYCS 414 Advanced Mechanics, Vijay Pandharipande
PHYCS 417 Lie Groups and Physics Applications,
PHYCS 419 Physics of Elasticity, Eduardo Fradkin
Dr. Riccardo Fantoni August 5, 2016
PHYCS 430 Surface Physics, Ehrlich Gert
PHYCS 450 Biomolecular Physics, Ulrich Nienhaus
PHYCS 464 Phase Transitions, Nigel Goldenfeld
PHYCS 470 Nuclei and Particles, Vijay Pandharipande
PHYCS 481 Quantum Mechanics II, Paul Goldbart
PHYCS 498C General Relativity I, Stuart Shapiro
PHYCS 498C General Relativity II, Stuart Shapiro
PHYCS 498C Compact Objects, Stuart Shapiro
PHYCS 498C Non Equilibrium Statistical Mechanics, Klaus Schulten
PHYCS 498 Spinors in Geometry and Physics, Robert Leigh and Steven B. Bradlow
PHYCS 498 General Field Theory, Eduardo Fradkin
PHYCS 498B Topology and Groups, Michael Stone and John P. D' Angelo
PHYCS 498 Very Degenerate Atomic Gases, Anthony J. Leggett

WORK EXPERIENCE

University of Illinois at Urbana/Champaign – Urbana, United States

Website: https://physics.illinois.edu/ | **Name of unit or department:** Physics department - **Business or sector:** Professional, scientific and technical activities

Graduate Student at UIUC

[1995 – 2000]

Teaching Assistant, Research Assistant
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University of Limerick – Limerick, Ireland

Website: https://www.ul.ie/scieng/schools-and-departments/department-mathematics-and-statistics | **Name of unit or department:** Department of Mathematics and Statistics - **Business or sector:** Professional, scientific and technical activities

Postdoc at the University of Limerick

[2000 – 2001]

Research

University Ca' Foscari of Venezia – Venice, Italy

Website: https://www.unive.it/pag/16775 | **Name of unit or department:** Chemical-Physics department - **Business or sector:** Professional, scientific and technical activities

Postdoc at UNIVE

[2004 – 2008]

Teaching, Research

National Institute for Theoretical Physics – Stellenbosch, South Africa

Website: https://nithecs.ac.za/ | **Name of unit or department:** National Institute for Theoretical Physics (NITheP) - **Business or sector:** Professional, scientific and technical activities

Postdoc at NITheP

[2009 – 2012]

Research

Ministero dell'Istruzione – Trieste, Italy

Business or sector: Education

School Teacher

[17/07/2015 – Current]

Habilitation to teach Mathematics and Physics (classes A049, A048, A047, A038) in Italian high-school obtained at the University of Trieste with mark 87/100. One year course with exams. "Abilitazione all' insegnamento nella scuola secondaria per la classe A049 Matematica e Fisica con punteggio 87/100"

Ministero dell'Istruzione – Trieste, Italy

Business or sector: Education

School Teacher

[24/08/2016 – Current]

Passed a "Concorso per l' assunzione in ruolo nell' insegnamento di Matematica (classe A026) nella scuola secondaria di secondo grado con punteggio 72.2/100"

Ministero dell'Istruzione – Trieste, Italy

Business or sector: Education

School Teacher

[01/09/2017 – Current]

Obtained a "Contratto a tempo indeterminato per l' insegnamento di Matematica nella scuola secondaria di secondo grado (confirmed on 1st September 2019)"

Ministero dell'Istruzione – Trieste, Italy

Website: https://www.nauticogalvani.edu.it | **Business or sector:** Education

School Teacher

[2018 – Current]

Teaching Mathematics at Istituto Tecnico Nautico "Tomaso di Savoia" of Trieste

Ministero della Ricerca – Italy

Business or sector: Professional, scientific and technical activities

University Associate Professor

[10/05/2019 – Current]

Habilitation for Associate Professor in Theoretical Physics of Matter (sector 02/B2) in the Italian University (until 10 May 2028)

LANGUAGE SKILLS

Mother tongue(s): Italian

Other language(s):

English	French
LISTENING C1 **READING** C1 **WRITING** B2	**LISTENING** A1 **READING** A1 **WRITING** A1
SPOKEN PRODUCTION B2 **SPOKEN INTERACTION** B2	**SPOKEN PRODUCTION** A1 **SPOKEN INTERACTION** A1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

SKILLS

wordprocessing

LATEX

languages

HTML / CSS / FORTRAN

operating systems

WINDOWS / MACOS / LINUX / ANDROID

mathematics software

MATHEMATICA / GEOGEBRA

PUBLICATIONS

PAPERS (1) Fantoni R. and Tosi M.P., Nuovo Cimento 17D, 155 (1995)dx.doi.org/10.1007/BF02451594WOS:A1995QW873000052-s2.0-51649140258
(2) Fantoni R. and Tosi M.P., Nuovo Cimento 17D, 1165 (1995)dx.doi.org/10.1007/BF02454131WOS:A1995TM364000092-s2.0-51649138270
(3) Fantoni R. and Tosi M.P., Physica B 217, 35 (1996)dx.doi.org/10.1016/0921-4526(95)00451-3WOS:A1996TR039000052-s2.0-0030561994
(4) Fantoni R., Jancovici B., and T´ellez G., J. Stat. Phys. 112, 27 (2003)dx.doi.org/10.1023/A:1023671419021WOS:

0001827113000022-s2.0-0037726817
(5) Fantoni R. and Pastore G., J. Chem. Phys. 119, 3810 (2003)dx.doi.org/10.1063/1.1590642WOS:0001844741000282-s2.0-0041376961
(6) Fantoni R. and Pastore G., Phys. Rev. E 68, 046104 (2003)dx.doi.org/10.1103/PhysRevE.68.046104WOS:0001865712000132-s2.0-0347566148
(7) Fantoni R. and Pastore G., Physica A 332, 349 (2004)dx.doi.org/10.1016/j.physa.2003.10.012WOS:0001880862000222-s2.0-0346215805
(8) Fantoni R. and Pastore G., J. Chem. Phys. 120, 10681 (2004)dx.doi.org/10.1063/1.1739392WOS:0002215382000342-s2.0-2942662065
(9) Fantoni R., Gazzillo D., Giacometti A., J. Chem. Phys. 122, 034901 (2005)dx.doi.org/10.1063/1.1831275WOS:0002267488000382-s2.0-22944457598
(10) Fantoni R., Gazzillo D., Giacometti A., Phys. Rev. E 72, 011503 (2005)dx.doi.org/10.1103/PhysRevE.72.011503WOS:0002308869000432-s2.0-27244434158
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(12) Gazzillo D., Giacometti A., Fantoni R., and Sollich P., Phys. Rev. E. 74, 051407 (2006)dx.doi.org/10.1103/PhysRevE.74.051407WOS:0002424087000472-s2.0-33751364294
(13) Gazzillo D., Fantoni R., and Giacometti A., Mol. Phys. 104, 3451 (2006)dx.doi.org/10.1080/00268970601050892WOS:0002439777000092-s2.0-34547821930
(14) Fantoni R., Gazzillo D., Giacometti A., Miller M. A., and Pastore G., J. Chem. Phys. 127, 234507 (2007)dx.doi.org/10.1063/1.2805066WOS:0002519085000332-s2.0-37549062945
(15) Gazzillo D., Fantoni R., and Giacometti A., Phys. Rev. E 78, 021201 (2008)dx.doi.org/10.1103/PhysRevE.78.021201WOS:0002592636000512-s2.0-49549117568
(16) Santos A., Fantoni R., and Giacometti A., Phys. Rev. E 77, 051206 (2008)dx.doi.org/10.1103/PhysRevE.77.051206WOS:0002568854000512-s2.0-44149108199
(17) Fantoni R. and T´ellez G., J. Stat. Phys. 133, 449 (2008)dx.doi.org/10.1007/s10955-008-9616-xWOS:0002603763000042-s2.0-54949158394
(18) Fantoni R., Giacometti A., Malijevsk´y A., and Santos A., J. Chem. Phys. 131, 124106 (2009)dx.doi.org/10.1063/1.3236515WOS:0002703803000102-s2.0-70349617808
(19) Gazzilo D., Fantoni R., and Giacometti A., Phys Rev. E 80, 061207 (2009)dx.doi.org/10.1103/PhysRevE.80.061207WOS:0002732275000612-s2.0-75349098936
(20) Santos A., Fantoni R., and Giacometti A., J. Chem. Phys. 131, 181105 (2009)dx.doi.org/10.1063/1.3265991WOS:0002724545000052-s2.0-72949085930

PAPERS (21) Fantoni R., Giacometti A., Malijevsk´y A., and Santos A., J. Chem. Phys. 133, 024101 (2010)dx.doi.org/10.1063/1.3455330WOS:0002799177000032-s2.0-77955754953
(22) Fantoni R., J. Stat. Mech. P07030 (2010)dx.doi.org/10.1088/1742-5468/2010/07/P07030WOS:0002817444000042-s2.0-77957073614
(23) Fantoni R., A. Giacometti, F. Sciortino, and G. Pastore, Soft Matter 7, 2419 (2011)dx.doi.org/10.1039/C0SM00995DWOS:0002881625000262-s2.0-79952395236
(24) Fantoni R., A. Malijevsk´y, A. Santos, and A. Giacometti, Europhys. Lett. 93, 26002 (2011)dx.doi.org/10.1209/0295-5075/93/26002WOS:0002873561000152-s2.0-79952604983
(25) Fantoni R., A. Malijevsk´y, A. Santos, and A. Giacometti, Mol. Phys. 109, 2723 (2011)dx.doi.org/10.1080/00268976.2011.597357WOS:0002991093000042-s2.0-84855979779
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(28) Fantoni R., Eur. Phys. J. B 85, 108 (2012)dx.doi.org/10.1140/epjb/e2012-20820-1WOS:0003026422000182-s2.0-85007085374
(29) Fantoni R., J. Stat. Mech. P04015 (2012)dx.doi.org/10.1088/1742-5468/2012/04/P04015WOS:0003035457000172-s2.0-84860526515
(30) Fantoni R., Salari J. W. O., Klumperman B., Phys. Rev. E 85, 061404 (2012)dx.doi.org/10.1103/PhysRevE.85.061404WOS:0003048580000032-s2.0-84862224594
(31) Fantoni R., Phys. Rev. B 86, 144304 (2012)dx.doi.org/10.1103/PhysRevB.86.144304WOS:0003095781000032-s2.0-84867308368
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s2.0-84868286397
(33) Fantoni R., Physica B 412, 112 (2013)dx.doi.org/10.1016/j.physb.2012.12.032WOS:000314764900023 2-s2.0-84873386313
(34) Fantoni R., Solid State Communications 159, 106 (2013)dx.doi.org/10.1016/j.ssc.2013.01.028WOS: 000317800900025 2-s2.0-84875448172
(35) Fantoni R. and Pastore G., Europhys. Lett. 101, 46003 (2013)dx.doi.org/10.1209/0295-5075/101/46003WOS: 000315999100021 2-s2.0-84874834405
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(37) Fantoni R. and Santos A., Phys. Rev. E 87, 042102 (2013)dx.doi.org/10.1103/PhysRevE.87.042102WOS: 000317104900005 2-s2.0-84876703163
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PAPERS (41) Fantoni R. and Santos A., J. Chem. Phys. 140, 244513 (2014)dx.doi.org/10.1063/1.4884353WOS: 000338634200051 2-s2.0-84903710390
(42) Fantoni R. and Pastore G., J. Chem. Phys 141, 074108 (2014)dx.doi.org/10.1063/1.4892878WOS: 000340714600011 2-s2.0-84906544798
(43) Fantoni R., Phys. Rev. E 90, 020102(R) (2014)dx.doi.org/10.1103/PhysRevE.90.020102WOS:000341289600001 2-s2.0-84907237529
(44) Fantoni R. and Moroni S., J. Chem. Phys 141, 114110 (2014)dx.doi.org/10.1063/1.4895974WOS: 000342843200014 2-s2.0-84907247021
(45) Fantoni R. and Pastore G., Mol. Phys. 113, 2593 (2015)dx.doi.org/10.1080/00268976.2015.1061150WOS: 000362544000028 2-s2.0-84943582307
(46) Fantoni R. Giacometti A. and Santos A., J. Chem. Phys 142, 224905 (2015)dx.doi.org/10.1063/1.4922263WOS: 000356176600037 2-s2.0-84934994542
(47) Fantoni R., Phys. Rev. E, 92, 012133 (2015)dx.doi.org/10.1103/PhysRevE.92.012133WOS:000358439000001 2-s2.0-84938788007
(48) Fantoni R., Eur. Phys. J. B 89, 1 (2016)dx.doi.org/10.1140/epjb/e2016-60917-9WOS:000375216500004 2-s2.0-84957802219
(49) Alastuey A. and Fantoni R., J. Stat. Phys. 163, 887 (2016)dx.doi.org/10.1007/s10955-016-1512-1WOS: 000374676000009 2-s2.0-84962025380
(50) Fantoni R., Physica A 457, 406 (2016)dx.doi.org/10.1016/j.physa.2016.03.024WOS:000376693600038 2-s2.0-84964504945
(51) Fantoni R., J. Stat. Phys. 163, 1247 (2016)dx.doi.org/10.1007/s10955-016-1510-3WOS:000375579300010 2-s2.0-84962010485
(52) Fantoni R., J. Stat. Phys. 166, 1334 (2017)dx.doi.org/10.1007/s10955-016-1707-5WOS:000395082700010 2-s2.0-85008514512
(53) Fantoni R., Physica A 477C, 187 (2017)http://dx.doi.org/10.1016/j.physa.2017.02.064WOS:000398873300017 2-s2.0-85014511370
(54) Fantoni R., J. Stat. Phys. 168, 652 (2017)http://dx.doi.org/10.1007/s10955-017-1810-2WOS:000405520600009 2-s2.0-85019677800
(55) Fantoni R. and Santos A., J. Stat. Phys. 169, 1171 (2017)https://doi.org/10.1007/s10955-017-1908-6WOS: 000415377700007 2-s2.0-85033500259
(56) Fantoni R., J. Stat. Mech. P113101 (2017)http://dx.doi.org/10.1088/1742-5468/aa9339WOS:000414639900001 2-s2.0-85038631104
(57) Fantoni R., J. Stat. Mech. P043101 (2018)http://dx.doi.org/10.1088/1742-5468/aab690WOS:000430327700001 2-s2.0-85046793056
(58) Fantoni R., Int. J. Mod. Phys. C 29, 1850028 (2018)http://dx.doi.org/10.1142/S0129183118500286WOS: 000430039400009 2-s2.0-85044467252
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PAPERS (61) Fantoni R., Physica A 524, 177 (2019)https://doi.org/10.1016/j.physa.2019.04.222WOS: 000476966100018 2-s2.0-85064919235
(62) Fantoni R., Indian J. Phys. 95, 1027 (2021)https://doi.org/10.1007/s12648-020-01750-2WOS:000543007600002 2-s2.0-85086857771
(63) Fantoni R., J. Low Temp. Phys. 202, 247 (2021)https://doi.org/10.1007/s10909-020-02532-0WOS: 000574338800001 2-s2.0-85091785958
(64) Fantoni R., Eur. Phys. J. B 94, 63 (2021)https://doi.org/10.1140/epjb/s10051-021-00078-yWOS:000630734900001 2-s2.0-85103348101
(65) Fantoni R. and Klauder J. R., Phys. Rev. D 103, 076013 (2021)https://doi.org/10.1103/PhysRevD.103.076013WOS: 000648579600007 2-s2.0-85105542365
(66) Fantoni R., J. Stat. Mech P083102 (2021)https://doi.org/10.1088/1742-5468/ac0f69WOS:000680165100001 2-s2.0-85111176604
(67) Fantoni R. and Klauder J. R., J. Stat. Phys. 184, 28 (2021)https://doi.org/10.1007/s10955-021-02818-xWOS: 000692401500001 2-s2.0-85111176723
(68) Fantoni R. and Klauder J. R., Phys. Rev. D 104, 054514 (2021)https://doi.org/10.1103/PhysRevD.104.054514WOS: 000704629900005 2-s2.0-85114892586
(69) Fantoni R., Maestre M. A. G., and Santos A., J. Stat. Mech P103210 (2021)https://doi.org/10.1088/1742-5468/ ac2897WOS:000711175900001 2-s2.0-85118939833
(70) Fantoni R., Mol. Phys. 120, 4 (2021)https://doi.org/10.1080/00268976.2021.1996648WOS:000712258400001 2-s2.0-85118339895
(71) Fantoni R. and Klauder J. R., Int. J. Mod. Phys. A 37, 2250029 (2022)https://doi.org/10.1142/S0217751X22500294W OS:000769229500003 2-s2.0-85126738235
(72) Fantoni R. and Klauder J. R., Int. J. Mod. Phys. A 37, 2250094 (2022)https://doi.org/10.1142/S0217751X22500944W OS:000811562100003 2-s2.0-85132227773
(73) Fantoni R., Eur. Phys. J. C 82, 843 (2022)https://doi.org/10.1140/epjc/s10052-022-10807-xWOS: 000861486700003 2-s2.0-85135756093
(74) Fantoni R. and Klauder J. R., Phys. Rev. D 106, 114508 (2022)https://doi.org/10.1103/PhysRevD.106.114508WOS: 000906363700004 2-s2.0-85144770879
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(79) Fantoni R., Quantum Rep. 6, 134 (2024)https://doi.org/10.3390/quantum6020010WOS:001378796000001 2-s2.0-85197275085
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(81) Fantoni R., The Physics Educator 6, 2420004 (2024)https://doi.org/10.1142/S266133952420004XWOS:2- s2.0-85206314521
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(83) Klauder J. R. and Fantoni R., Academia Quantum 1 (2024)https://doi.org/10.20935/AcadQuant7349WOS:2-s2.
(84) Fantoni R., Quantum Rep. 6, 706 (2024)https://doi.org/10.3390/quantum6040042WOS:001383999700001 2- s2.0-85213559285
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(87) Fantoni R., Physica A 672 130649 (2025)https://doi.org/10.1016/j.physa.2025.130649WOS:001501569800001 2- s2.0-105005870464
(88) Klauder J. R. and Fantoni R., Crystall Journal of Physics 1, 1 (2025)?WOS:?2-s2.?
(89) Fantoni R., Gravitation and Cosmology 31, 568 (2025)https://doi.org/10.1134/S020228932570044 6WOS:

0016308724000112-s2.0-105024194930
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(92) Fantoni R., Mol. Phys. 124, 4 (2026)https://doi.org/10.1080/00268976.2025.2525537WOS:0015201076000012-s2.0-105009503957
(93) Fantoni R., Gravitation and Cosmology 32, 314 (2026)https://doi.org/10.1134/S020228932670012XWOS:2-s2.
(94) Fantoni R., Quantum Rep. 8, 12 (2026)https://doi.org/10.3390/quantum8010012WOS:0017253705000012-s2.

BOOKS (1) Fantoni R. “Regole di somma in un gas di elettroni stratificato”,ISBN 978-889-101-539-6
(2) Fantoni R. “Classical liquids: exact results, integral equations theory, and Monte Carlo simulations”,ISBN 978-889-101-543-3
(3) Fantoni R. “The Janus fluid, from a theoretical perspective”, SpringerBriefs in Physics, (2013),ISBN 978-3-319-00406-8 (Print) 978-3-319-00407-5 (Online), dx.doi.org/10.1007/978-3-319-00407-5
(4) Fantoni R. "Discoveries due to the observation of mathematics", Kindle Direct Publishing
(5) Fantoni R. "Unifying Classical and Quantum Physics. How classical and quantum physics can pass smoothly back and forth", Springer Nature (2025), Print ISBN-10: 3031981227, Print ISBN-13: 978-3-031-98122-7, Electronic ISBN-13: 978-3-031-98123-4

NETWORKS AND MEMBERSHIPS

[Current]
Physics societies SIF (Societa' Italiana di Fisica), EPS (European Physical Society)

DRIVING LICENCE

Driving Licence: A
Driving Licence: B

CONFERENCES AND SEMINARS

[1994 – 2011]
SEMINARS 1994 Napoli CNR meeting. Poster on publication (1).2002 National school of Matter Physics on “Fisica di base delle Nanostrutture e Calcolo edInformazione Quantistica” (Torino Villa Gualino 9/9/2002-20/9/2002).2002 School on “Fisica Statistica, Teoria della Probabilit´a e Complessit´a computazionale”(ICTP Trieste 26/8/2002-7/9/2002).2003 XXII Fai della Paganella meeting: “Fisica Teorica e Struttura della Materia”. Posterson publication (4) and on publication (5).2004 XXIII Fai della Paganella meeting: “Fisica Teorica e Struttura della Materia”. Posteron publication (6).2004 “IX Convegno Nazionale di Fisica Statistica e dei Sistemi Complessi” (Parma 22-24June). Talk on publication (8).2004 IV Giovanni Paladin Memorial: “Statistical Mechanics, Chaos and Condensed MatterTheory” (Rome 22-24 September). Poster on publication (9).2005 “X Convegno Nazionale di Fisica Statistica e dei Sistemi Complessi” (Parma 29-1 July).Poster on publications (9) and (10).2005 “6th Liquid Matter Conference” (Utrecht, the Netherlands 2-6 July). Poster on publications(9) and (10).2006 “31st Conference of the Middle European Cooperation in Statistical Physics” (Primo˘sten,Croatia 23-26 April). Poster on publication (10).2007 “Fluid phase behaviour and critical phenomena from liquid state theories and simulations”(CECAM, Lyon, France 12 July). Invited speaker on publications (14) and (15).2007 “Statphys23” (Genova, Italy 9-13 July). Poster on publications (14) and (15).2008 “7th Liquid Matter Conference” (Lund, Sweden 27 June-1 July). Poster on publications(14) and (15).2009 “Long-range Interactions in Classical and Quantum Physics” (Stellenbosch, South Africa16-27 November). Invited talk on publication (17).2010 “21st Chris Engelbrecht Summer School in Theoretical Physics” (Stellenbosch, SouthAfrica 18-27 January).2010 “35th Conference of the Middle European Cooperation in Statistical Physics” (Abbayedes Pr´omontr´es, Pont-`a-Mousson, France 15-19 March). Poster on publication (16), (18),and (20).2010 “Statphys24” (Cairns, Australia

19-23 July). Oral presentation on publication (17).2010 Invited talk at the University of Extremadura in Badajoz on publications (16), (18), (20),(21), and (24).2011 "22st Chris Engelbrecht Summer School in Theoretical Physics" (Stellenbosch, SouthAfrica 19-30 January).2011 "Equilibration and Equilibrium 2nd Stellenbosch Workshop on Statistical Physics" (Stellenbosch,South Africa 7-18 March). Invited talk on publication (24).2011 "Workshop on Frontiers in Ultracold Fermi Gases" (Trieste, ICTP, Italy 6-10 June).Poster on publications (33) and (39).

[2011 – 2018]

SEMINARS 2011 "8th Liquid Matter Conference" (Vienna, Austria, 6-10 September). Poster on publications(23) and (24).2011 "National Institute for Theoretical Physics of South Africa (NITheP)" (Stellenbosch,South Africa, 21 Sptember). Invited talk on publication (23).2011 "InternationalWorkshop on UltracoldMolecules" (Stellenbosch, South Africa, 7-11 November).2012 "XCVIII Congresso Nazionale SIF" (Napoli, Italy, 17-21 September). Abstract on publication(30).2013 "38st Conference of the Middle European Cooperation in Statistical Physics" (Trieste,Italy, 25-27 March). Poster on publications (34) and (39).2013 "Italian National Conference on Condensed Matter Physics" (Milano, Italy, 9-13 September).Invited talk on publication (41).2013 "XCIX Congresso Nazionale SIF" (Trieste, Italy, 23-27 September). Abstract on Publication(36) and (40).2013 Invited talk at the University of Extremadura in Badajoz on publications (41).2014 "Sigma-Phi-2014" (Rhodes, Greece, 7-11 July). Talk on publication (43) and (44).2015 "Italian National Conference on Condensed Matter Physics (FisMat 2015)" (Palermo,Italy, 28 September-2 October). Invited talk on publication (46).2017 Invited talk at the University of Extremadura in Badajoz on publications ....2017 "Workshop on Understanding Quantum Phenomena with Path Integrals: From ChemicalSystems to Quantum fluids and Solids — (smr 3131)" (Trieste, ICTP, 3-7 July).Partecipant.2017 "10th Liquid Matter Conference" (Ljubljana, Slovenia, 17-21 July). Poster on publications(55)2017 "Italian National Conference on Condensed Matter Physics (FisMat 2017)" (Trieste,Italy, 1-5 October). Invited talk on publication (55)2018 "6th World Congress and Expo on Nanotechnology and Material Science" (Valencia,Spain, 16-18 April). Invited Talk on publication (59)

CREATIVE WORKS

[Current]

SCIENTIFIC SOFTWARE AVAILABLE TO THE INTERNATIONAL SCIENTIFIC COMMUNITTY • Development of a Mathematica notebook which evaluates the radial distribution functionsfor binary mixtures of nonadditive hard spheres, according to the method described inR. Fantoni and A. Santos, "Nonadditive hard-sphere fluid mixtures. A simple analyticaltheory", Phys. Rev. E 84, 041201 (2011).
• Development of a Gibbs Ensemble Monte Carlo algorithm to determine the phase propertiesof a ionic fluid of non-additive hard spheres, according to the method described in R.Fantoni and G. Pastore "Monte Carlo simulation of the nonadditive restricted primitivemodel of ionic fluids: Phase diagram and clustering", Phys. Rev. E 87, 052303 (2013).
• Development of a new Quantum Monte Carlo algorithm to determine the phase propertiesof a quantum fluid of bosons, according to the method described in R. Fantoni and S.Moroni, "Quantum Gibbs ensemble Monte Carlo", J. Chem. Phys. 141, 114110 (2014).

RESEARCH STATEMENT:

[Current]

RESEARCH STATEMENT:

Aim of the research is to develop analytical and computational methods for condensed and soft matter starting from the fundamental many-body equations. Apart from the few analytically exactly solvable models our principal instruments, guided by the various sum-rules, are Integral Equation Theory, Density Functional Theory, Thermodynamic Perturbation Theory, Association Theory, and Monte Carlo simulations which can find exact properties of many-body systems. We are combining these approaches to create new methods and to test the accuracy of calculations on materials. Current studied materials include colloidal suspensions, ionic liquids, polymer mixtures, the electron fluid, the polaron, and boson fluids (like ^4He, ^4He-H_2 mixtures, ...). We investigate the structure and thermodynamic properties of the materials including their phase transitions like the gas-liquid-(glass)-solid first order ones and the superfluid-superconducting second order ones, the percolation threshold, the clustering, the localization, the demixing, the polydispersity, and surface properties.

RESEARCH INTERESTS:

[Current]

RESEARCH INTERESTS:

Non-Equilibrium Statistical Mechanics:

From the Liouvillian dynamics to the Fokker-Planck equation. From the Fokker-Planck equation to the Smoluchowski equation. The Langevin equation. Monte Carlo solution of the Smoluchowski equation.

Statistical Mechanics:

Sum rules in many body systems, many body models soluble exactly analytically, integral equation theories for fluids (Percus-Yevick, hypernetted chain, mean spherical approximation, rational function approximation,. . .), thermodynamic perturbation theories, Monte Carlo methods, stochastic processes.

Condensed and Soft Matter Physics:

Coulomb liquids, the polaron, Bosons fluids, colloidal suspensions, polymers.

Quantum fluid models:

The Jellium in one, two, and three spatial dimensions and the polaron problem. The Jellium on parallel planes and on a sphere.
Square-well Bosons as a model of cold atoms. The 4He in three and two dimensions. 4He-H2 mixtures.

Classical fluid models:

The one-dimensional nearest-neighbor fluids, the one- and twocomponent plasma living in one-, two-, and three-dimensions, the one- and two-component plasma living on curved surfaces, the hardsphere fluid, the penetrable square-well fluid in one-, two-, and three-dimensions, the non-additive hard-sphere mixture, theWidom-Rowlinson model, the sticky-hard-sphere one- and two-component fluid, the restricted primitive model for charged hard spheres, patchy spheres fluids (the Janus fluid, etc . . .).

Quantum field theory:

Path integral Monte Carlo of lattice field theory subject to different kinds of quantization procedures.

Numerical methods (NM) of interest:

The solution of integral equation theories and the Monte Carlo

methods to perform computer experiments.

NM for the solution of integral equation theories:

The Newton Raphson algorithm (with conjugated gradient method)

and the Picard algorithm.

NM for Monte Carlo simulations:

Ground state Monte Carlo simulations (variational and diffusion),

path integral Monte Carlo simulations (conventional and worm algorithm),

classical Monte Carlo simulations (NVT, NPT, grand

canonical, Gibbs ensemble).

REVIEWER

[1995 – Current]

Reviewer of Physics Journals

1. reviewer for the American Mathematical Society (AMS)
2. reviewer for the American Physical Society (APS)
3. reviewer for the American Institute of Physics (AIP)
4. reviewer for the Institute of Physics (IOP)
5. reviewer for the Royal Society of Chemistry (RSC)
6. reviewer for the European Physical Society (EPS)
7. reviewer for the J. High Energy Phys., Gravitat. Cosmol.

EDITORIAL BOARD

[2023 – Current]

Member of Editorial Boards of Scientific Journals

Editorial Board Member of American Journal of Modern Physics (AJMP) from 18 April 2023

to 18 April 2025

Editorial Board Member of Journal of Information Analysis from 25 April 2023

RESPONSIBILITY IN PROJECTS OF SUPERCOMPUTING

[1995 – Current]

Responsibility in projects of supercomputing

1995-2000 Use of the facilities of NCSA at Urbana/Champaign, Illinois, U.S.A.

2010-2012 Use of the facilities of CHPC at Cape Town, South Africa

2011-now Use of the facilities of CINECA at Bologna, ItalyWrite here the description...

SUPERVISION OF STUDENTS

Supervision of Ph.D. Students

Cosupervision of the Ph.D. thesis of Joris W. O. Salari in the department of polymer chemistry of the University of Technology of Eindhoven in the Netherlands. Supervisor: Prof. Bert Klumperman. Title: "Pickering emulsions, colloidosomes & micro-encapsulation"

Cosupervision of the Ph.D. thesis of Miguel A. G. Maestre in the physics department of the University of Extremadura in Spain. Supervisor: Prof. Andres Santos. Title: "Structural and thermophysical properties of models of Janus particles with fixed orientation"

SHORT VISITS AND SCIENTIFIC COLLABORATIONS

[1995 – 2018]

SHORT VISITS AND SCIENTIFIC COLLABORATIONS

1995-2000 Collaboration in the Physics Department at the University of Illinois at Urbana-Champaign, USA with the research group of Prof. David Ceperley and Prof. Richard Martin.

2000-2001 Collaboration with the Research group of Prof. S. B. G. O'Brien at the Department of Mathematics and Statistics, University of Limerick, Ireland.

2001-2004 Collaboration with the research group of Prof. Giorgio Pastore at the Theoretical Physics Department of the University of Trieste, Italy.

2003 January: Visiting Scientist (1 month) at the University of Paris-Sud at Orsay. Scientific collaboration with the research group of Prof. Bernard Jancovici at the Laboratory of Theoretical Physics of the University of Paris-Sud at Orsay, France.

2004-2006 Title of the project: "Analysis of proteins in solutions using statistical thermodynamic techniques". Project PRIN-COFIN2003025755-044. University "Ca' Foscari" of Venice, Italy. National coordinator Prof. Amos Maritan. Local coordinator Prof. Achille Giacometti.

2006-2008 Title of the project: "Colloidal mixtures, globular proteins and liquid crystal-like phases of biopolymers". Project PRIN-COFIN2005027330. University "Ca' Foscari" of Venice, Italy. National coordinator Prof. Amos Maritan. Local coordinator Prof. Achille Giacometti.

2009 Research group of Prof. Michael Kastner at the National Institute of Theoretical Physics of the University of Stellenbosch, South Africa.

2009-2011 Research group of Prof. K. K. M¨uller-Nedebock in the Physics Department at the University of Stellenbosch, South Africa.

2010 October 10th: Visiting scientist (three months) at the University of Extremadura in Badajoz, Spain. Scientific collaboration with the research group of Prof. Andr´es Santos in the Physics Department at the University of Extremadura in Badajoz, Spain.

2011 Research group of Prof. Bert Klumperman in the Polymer Physics Department at the University of Stellenbosch, South Africa.

2013 October 20th: Visiting Scientist (one month) at the University of Extremadura in Badajoz, Spain. Scientific collaboration with the research group of Prof. Andr´es Santos in the Physics Department at the University of Extremadura in Badajoz, Spain.

2014 Research group of Prof. Saverio Moroni in Scuola Internazionale Superiore di Studi Avanzati (SISSA), Italy.

2014 June 15th: Visiting Scientist (one week) at the "Laboratoire de Physique ENS de Lyon", France. Scientific collaboration with the research group of Prof. Angel Alastuey.

2017 January 8th: Visiting Scientist (two months) at the University of Extremadura in Badajoz, Spain. Scientific collaboration with the research group of Prof. Andr´es Santos in the Physics Department at the University of Extremadura in Badajoz, Spain.

2018 March 26th: Visiting Scientist (one week) at the "Laboratoire de Physique ENS de Lyon", France. Scientific collaboration with the research group of Prof. Angel Alastuey.

PARTICIPATION TO NATIONAL AND INTERNATIONAL RESEARCH GROUPS

[1995 – 2018]

PARTICIPATION TO NATIONAL AND INTERNATIONAL RESEARCH GROUPS

1995-2000 Research Assistant in the Physics Department at the University of Illinois at Urbana-Champaign, USA. Coordinators: Prof. David Ceperley and Prof. Richard Martin.

2000-2001 Research group of Prof. S. B. G. O'Brien at the Department of Mathematics and Statistics, University of Limerick, Ireland.

2001-2004 Research group of Prof. Giorgio Pastore at the Theoretical Physics Department of the University of Trieste, Italy.

2003 Research group of Prof. Bernard Jancovici at the Laboratory of Theoretical Physics of the University of Paris-Sud at Orsay, France.

2004-2006 Title of the project: "Analysis of proteins in solutions using statistical thermodynamic techniques". Project PRIN-COFIN2003025755-044. University "Ca' Foscari" of Venice, Italy. National coordinator Prof. Amos Maritan. Local coordinator Prof. Achille Giacometti.

2006-2008 Title of the project: "Colloidal mixtures, globular proteins and liquid crystal-like phases of biopolymers". Project PRIN-COFIN2005027330. University "Ca' Foscari" of Venice, Italy. National coordinator Prof. Amos Maritan. Local coordinator Prof. Achille Giacometti.

2009 Research group of Prof. Michael Kastner at the National Institute of Theoretical Physics of the University of Stellenbosch, South Africa.

2009-2011 Research group of Prof. K. K. M¨uller-Nedebock in the Physics Department at the University of Stellenbosch, South Africa.

2010 Research group of Prof. Andr´es Santos in the Physics Department at the University of Extremadura in Badajoz, Spain.

2011 Research group of Prof. Bert Klumperman in the Polymer Physics Department at the University of Stellenbosch, South Africa.

2013 Research group of Prof. Andr´es Santos in the Physics Department at the University of Extremadura in Badajoz, Spain.

2014 Research group of Prof. Saverio Moroni in Scuola Internazionale Superiore di Studi Avanzati (SISSA), Italy.

2014 Research group of Prof. Angel Alastuey in the “Laboratoire de Physique ENS de Lyon”, France.

2017 Research group of Prof. Andr´es Santos in the Physics Department at the University of Extremadura in Badajoz, Spain.

2018 Research group of Prof. Angel Alastuey. in the “Laboratoire de Physique ENS de Lyon”, France.

POSITIONS HELD

[1996 – 2006]

POSITIONS HELD

1996 summer: Research Assistant in the Physics department at the University of Illinois at Urbana-Champaign. Coordinators David Ceperley and Richard Martin.

1997 summer: Research Assistant in the Physics department at the University of Illinois at Urbana-Champaign. Coordinators David Ceperley and Richard Martin.

1997 fall: Research Assistant in the Physics department at the University of Illinois at Urbana-Champaign. Coordinators David Ceperley and Richard Martin.

2000 Won a Ph.D. position (BAT-O IIa/2) at the Max-Planck-Institute f¨ur Plasmaphysik, Teilinstitut Greifswald, Bereich Stellaratortheorie at the 5th of January 2000 which I declined.

2000 Research Assistant (1 year) at the Department of Mathematics and Statistics, University of Limerick, Ireland in the group of S. B. G. O’Brien.

2003 January, Visiting Scientist at the University of Paris-Sud at Orsay. Scientific collaboration with the research group of Prof. Bernard Jancovici.

2004 April 15th, “Assegno di ricerca” (Postdoctoral Fellowship 24 months) at the Department of Chemical Physics, University “Ca’ Foscari” of Venice. Title of the project: “Analysis of proteins in solutions using statistical thermodynamic techniques”. Project PRINCOFIN2003025755-044. National coordinator Prof. Amos Maritan. Local coordinator Prof. Achille Giacometti.

2006 March 17th, “Assegno di ricerca” (Postdoctoral Fellowship 24 months) at the Department of Chemical Physics, University “Ca’ Foscari” of Venice. Title of the project: “Colloidal mixtures, globular proteins and liquid crystal-like phases of biopolymers”. Project PRINCOFIN2005027330. National coordinator Prof. Amos Maritan. Local coordinator Prof.

Achille Giacometti.

[2009 – 2019]

POSITIONS HELD

2009 October 15th, Postdoctoral Fellowship (36 months) at the National Institute of Theoretical Physics (NITheP), Stellenbosch Institute for Advanced Study, Matieland 7602, South Africa.

2010 October 10th, Visiting scientist (three months) at the University of Extremadura in Badajoz, Spain. Scientific collaboration with the research group of Prof. Andr´es Santos.

2012 January 1st, Guest (three years) at S.I.S.S.A., via Bonomea 265, 34136 Trieste, Italy.

2012 January 1st, Honorary Fellow at the Department of Molecular Science and Nanosystems, University "Ca' Foscari" of Venice, Calle Larga S. Marta DD2137, I-30123 Venezia, Italy.

2015 July 17th: Habilitation to teach Mathematics and Physics (classes A049, A048, A047, A038) in Italian high-school obtained at the University of Trieste with mark 87/100. One year course with exams. "Abilitazione all' insegnamento nella scuola secondaria per la classe A049 Matematica e Fisica con punteggio 87/100".

2016 August 24th: Passed a "Concorso per l' assunzione in ruolo nell' insegnamento di Matematica (classe A026) nella scuola secondaria di secondo grado con punteggio 72.2/100".

2017 September 1st: "Contratto a tempo indeterminato per l' insegnamento di Matematica nella scuola secondaria di secondo grado (confirmed on 1st September 2019)".

2019 May 10th: Habilitation for Associate Professor in Theoretical Physics of Matter (sector 02/B2) in the Italian University.

TEACHING

[1995 – Current]

TEACHING

1995/2000 Teaching Assistant in the Physics department at the University of Illinois at Urbana-Champaign (Electricity and Magnetism I and II, Biomolecular Physics, Waves in Physics, Thermal Physics and Fluids, Classical Mechanics, Electricity, Magnetism, and Optics, Waves and Quantum mechanics/Thermal Physics and Fluids).

2004/2006 Teaching at University Ca' Foscari of Venice (Mathematical Methods for Science and Technlogy of Materials, Analysis II).

2008/2009 Teaching at University of Trieste (General Physics I fo Industrial Engineering).

2012/2013 Teaching Assistant at University of Trieste (Laboratory of Optics).

2013/2014 Teaching Assistant at University of Trieste (Laboratory of Calculus).

2015/2017 Teaching in Italian High-School.

2018/ Teaching at Istituto Tecnico Nautico "Tomaso di Savoia" (https://www.nauticogalvani.edu.it/) as a confirmed mathematics professor.

Trieste, 29/05/2026

Riccardo Fantoni