

Curriculum Vitae F.Fucito

PERSONAL DATA

- Place and date of birth : Tagliacozzo, Italy August 16th 1957
- Citizenship : Italian
- Marital Status : Married
- Employer : Istituto Nazionale di Fisica Nucleare

CURRICULUM STUDIORUM

- Primary Studies : Scientific High School, Final Mark : 60/60, Liceo Scientifico A.Righi, Rome, 1976
- Secondary Studies : Laurea in Fisica, Final Mark : 110/110 cum laude, Universita' degli Studi di Roma "La Sapienza", September 21st 1980.
- Title of These Work : Computation of the Critical Indices of Percolation
- Advisor : Giorgio Parisi
- Recipient of the Della Riccia Fellowship in 1981

ACADEMIC RECORD

- October 1980-February 1981 : Visitor CERN, Geneva, Switzerland
- April 1981-May 1981 : Visitor (Collaboration with K.Wilson) Cornell University. Ithaca, New York, USA
- September 1982-September 1985 : Weingarten Fellow, California Institute of Technology, Pasadena, California, USA
- October 1985-December 1985 : Visitor CERN, Geneva, Switzerland
- October 1986-February 1987 : Lecturer Ecole Normale Superieure, Paris, France
- September 1988-August 1990 : Fellow CERN, Geneva, Switzerland
- April 1985-April 1995 Researcher University of Rome Tor Vergata
- April 1995-April 2002 First Researcher, Istituto Nazionale di Fisica Nucleare
- April 2002- Director of Research, Istituto Nazionale di Fisica Nucleare

TEACHING RECORD

- Academic Year 86/87 and 87/88 Teaches Classical Mechanics for Undergraduates
- Academic Year 90/91 and 91/92 Teaches Group Theory for Graduate Students
- Academic Year 92/93 , 93/94 and 94/95 Teaches Theoretical Physics for Undergraduates
- Academic Year 1995 until nowadays Teaches Supersymmetry for Graduate Students
- Academic Year 2002 until nowadays Teaches Statistical Mechanics for Undergraduates

THESIS TUTORING RECORD

Undergraduate Thesis

- Maura Brunetti, Gravitational Scalar Waves from Binary Sources, Academic Year 1995/96
- C.Carpi, ADHM Construction for ALE spaces , Academic Year 1996/97
- D.Salvino, How to detect Scalar Gravitational Waves, Academic Year 1997/98
- L.Baiotti, Scalar and Tensorial Gravitational Theories and Post-Newtonian Formalism, Academic Year 1999/2000 (PhD at SISSA in 2004 now at Graduate School of Science and Laser Engineering, Osaka University, Toyonaka, Japan)
- G.Delfinis, SUSY Dark Matter in Cosmic Gamma Rays, Academic Year 1999/2000
- F.Biancalana, New Directions in Supersymmetric Instanton Calculus, Academic Year 2000/01
- A.Mammarella, Supersymmetry and Dark Matter, , Academic Year 2007/
- Daniel Ricci Pacifici, Decays of the Lightest Supersymmetric Particle in presence of an anomalous $U(1)$, Academic Year 2008/2009 PhD THESIS
- D.Bellisai, Topological Invariants for a String Effective Theory, Academic Year 1994/95 (now researcher at National Institute for Statistics, ISTAT, Rome, Italy)
- G.Travaglino, Instanton Calculus in SUSY Theories, Academic Year 1995/1996 (now Reader in Theoretical Physics at Queen's Mary College, London, UK)
- A.Tanzini, Yang-Mills Theory as a Deformation of the Topological BF, Academic Year 1997/98 (now Associate Professor at SISSA Trieste, Italy)
- A.Lionetto, Supersymmetric Dark Matter Analysis with Gamma Rays, Academic Year 2002/03
- A.Cesarini, SUSY breaking in the Standard Model, Academic Year 2002/03 (now Head of Financial Engineering, Banca Aletti, Gruppo banco Popolare, Milan, Italy)
- M.D'Alessandro, Perturbative and Non-Perturbative Aspects of extended SUSY Theories, Academic Year 2004/05 (Researcher at ISPESL (Public Institute for Safety on the Workplace), Rome, Italy)
- M.Prisco, Extra Dimensions and Dark Matter, Academic Year 2006/07
- A.Racioppi, A $U(1)$ anomalous extension of the MSSM, , Academic Year 2007/08 (Postdoc at the National Institute of Chemical Physics at Tallin, Estonia)
- D.Cassani, , String Theory Compactifications with Fluxes and Generalizes geometry, Joint PhD between the University of Rome Tor Vergata and Ecole Normale Supérieure (Advisor A.Bilal) Academic Year 2008/09 (now Postdoc Department of Mathematics, King's College, London, UK)
- A.Mammarella, Anomalous $U(1)$, Dark Matter and Asymmetry, Academic Year 2008/09
- D.Ricci Pacifici, Issues in Supersymmetric Gauge theories, Academic Year 2009/10 (Now at Cassa Depositi e Prestiti, Rome, Italy)

GRANTS (PAST AND PRESENT)

- Supervisor for the Host Institution of the Marie-Curie Grant IIF-2008-22157 (Title: Non perturbative Super Yang-Mills Theories) First phase ended February 2011 Return Phase ends February 2012
- Member of the Tor Vergata Node for the ERC Grants HPRN-CT-2000-00122, HPRNCT-2000-00131 and HPRN-CT-2000-00148, MRTN-CT-2004-503369, MRTN-CT-2004-512194
- INTAS Project, 99-1-590 and 03-51-6346
- NATO Grant PST.CLG.97878
- Member of the Tor Vergata Node for the PRIN (Project of Relevant National Interest) Grants 2001-025492, 2003-023852, 2005-024045 (ends 2010), Financed from the Italian Ministry of Research and Education
- Supervisor and member for the INFN group at Tor Vergata of the funds for the scientific project PD51, PI14, TS11, TV12 (ongoing-Title: String Theory and Fundamental Interactions) more info on the programs at (<http://www.infn.it/indexen.php>)

10-Year track-record for F.Fucito

In the past ten years the applicant has written around 30 papers on different subjects. Its main activity has been centered on non perturbative effects in supersymmetric gauge theories but he has also touched upon the phenomenology of the supersymmetric extension of the standard model from the point of view of accelerator physics and astroparticles. For what supersymmetric gauge theories are concerned he, and collaborators, have

contributed to the evaluation of non perturbative effects for four dimensional gauge theories with eight supersymmetric charges with field theory methods i.e. instanton calculus. After having performed a series of explicit computation they have finally used localization and have extended the results thus obtained in various different direction: quiver theories, Sp and SO gauge groups, ALE manifolds. These extensions have been proved very useful also in the light of their connection to two dimensional CFT as shown by Alday, Gaiotto and Tachikawa. Moreover he has provided a reformulation of such results in terms of string theories and D-branes, D-branes with fluxes. The main outcome of this is the possibility of new non perturbative effects in string theories dubbed exotic instantons: such effects can appear in D-branes at angle, D(-1)-D7 systems or quiver theories. They can be used for many purposes in mathematics and physics: for example they can give a mass to a right handed neutrino in a supersymmetric extension of the standard model and are relevant to F-theories. These methods have also been extended to systems of D3-D7 branes thus creating an exotic instanton calculus for such systems. Their validity has been checked in many instances such as the type I'/heterotic string duality.

From the point of view of the phenomenology of high energy particle physics these theories carry extra gauge $U(1)$'s and they have been studied in a bottom-up approach. Their relevance to the problem of dark matter has also been investigated. Worth mentioning is also a study on the excess of gamma rays coming from the galactic center with a possible explanation in terms of supersymmetry.

For more than 10 years the applicant has taught Statistical Mechanics for undergraduate and Supersymmetry for master and PhD students at the University of Rome Tor Vergata. Together with M. Cini and M. Sbragaglia he is the author of "*Solved Problems in Quantum and Statistical Mechanics*", Springer London, Limited, January 2012

INVITATIONS TO CONFERENCE

- 1) IPM School on Instantons, Tehran, Iran, February 1-8, 2015
- 2) Workshop on Frontiers in Field and String Theory, Yerevan, Armenia from September 21-26, 2014.
- 3) Workshop on Geometric Correspondences of Gauge Theories, Trieste, Italy, September 9-13, 2013
- 4) Workshop on Geometric correspondences of gauge theories, Trieste, Italy, September 28-30, 2011
- 5) String Phenomenology, Workshop at Nordita, Stockholm, Sweden, May 30-June 25, 2011
- 6) Differential and Topological Problems in Modern Theoretical Phys., Trieste, Italy, April 26-30, 2010
- 7) Black holes entropy i.e. counting black holes microstates, Trieste INFN Workshop, February 2007
- 8) Dark Matter and extra-dimensions, Vulcano Workshop 2006, Vulcano May 2006
- 9) Non perturbative results in SUSY gauge theories, WAGP Lisbon February 2005
- 10) The European Superstring Network Kick-Off Meeting, Max Planck Institute, Golm, April 2006
- 11) Instantons in SUSY gauge theories, Meeting sponsored by the COFIN GRANT “Teorie di gauge, gravita’ e stringhe, Capri, Italy October 2003
- 12) Non Perturbative Results in SUSY Gauge Theories, Meeting sponsored by the COFIN GRANT “Teorie di gauge, gravita’ e stringa”, Capri, Italy, October 2002
- 13) Search for Dark Matter with GLAST, 1st International Conference on particle and Fundamental Physics in Space, La Biodola, Isola d’Elba, Italy, 14-19 May 2002

CONFERENCE ORGANIZED

- 1) RICAP’11 (<http://ricap11.roma3.infn.it/>), 3rd Roma International Conference on Astro Particle Physics, Rome, May 25-27, 2011
- 2) “Strings 2009” (<http://strings2009.roma2.infn.it/>), Rome 22-26 June 2009
- 3) RICAP’09 (<http://ricap09.roma2.infn.it/>), 2nd Roma International Conference on Astro Particle Physics Villa Mondragone, Frascati (Rome), May 2009
- 4) “Theories of the Fundamental Interactions” (<http://fundint08.roma2.infn.it/>), Meeting of the INFN Networks MI12, PI14, TS11, and TV12, Villa Mondragone, Frascati (Rome), June 26-28 2008.
- 5) String Phenomenology 2007 (<http://people.roma2.infn.it/~stringpheno2007/>), Bruno Touschek Lecture Hall, Frascati, June 4-8 2007
- 6) EC-RTN “Superstring Theory” (http://people.roma2.infn.it/~stringhe/casabianca_03/asciano.htm) Casa Bianca Workshop, Asciano (Siena) April 8-12 2003

MANAGING APPOINTMENTS

- 1998-2004 Member of the National INFN Committee for Theoretical Physics
- 2004 Referee for the experiment MIR of the INFN Astroparticle Committee
- 2004- Member of the PhD Council at the University of Rome Tor Vergata
- 2007 ERC Referee for ITN evaluation
- 2007- Director of the INFN group at the University of Rome Tor Vergata
- 2007- Member of the National INFN Governing Board