

Salvatore Micciché

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Department of Physics and Chemistry

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CURRENT POSITION

16 September 2015 Associate Professor

scientific sector **FIS/07 (Applied Physics)**
Department of Physics and Chemistry of Palermo University

PREVIOUS POSITIONS

3 January 2005 Assistant Professor

15 September 2015 scientific sector FIS/07 (Applied Physics)

Department of Physics and Chemistry, *Faculty of Medicine and Surgery* of Palermo University

1 May 2003 Researcher (Ricercatore INFN III liv. - 3 years)

2 January 2005 National Institute for the Physics of Matter - Research Unit of Palermo, Palermo (I)
FIRB Project: *Cellular Self-Organizing nets and chaotic nonlinear dynamics to model and control complex system*

Scientific Tutor: Prof. R. N. Mantegna

1 January 2002 Post-doc (Assegnista di Ricerca)

30 April 2003 University of Palermo, Department of Physics and Related Technologies, Palermo (I)

Project: *Study of Stochastic Processes with Long-Range Correlations*
Scientific Tutor: Prof. R. N. Mantegna

1 October 2001 Collaboration (Collaborazione Occasionale)

31 December 2001 National Institute for the Physics of Matter - Research Unit of Palermo, Palermo (I)

Project: *Study of Stochastic Processes with Long-Range Correlations*
Scientific Tutor: Prof. R. N. Mantegna

1 July 2000 Post-doc (Assegnista di Ricerca)

30 June 2001 National Institute for the Physics of Matter - Research Unit of Palermo, Palermo (I)

Project: *Volatility in Financial Markets*
Scientific Tutor: Prof. R. N. Mantegna

EDUCATION

21 December 1999 Ph.D. in General Relativity

Loughborough University, Department of Mathematical Sciences, Loughborough (UK)

Project: *Physical Properties of Gravitational Solitons*

Supervisor: Prof. J. B. Griffiths

Such title has been recognized by the Italian Ministry of Education as equivalent to the Italian **Dottore di Ricerca** (13/06/2000)

16 March 1995 Degree in Physics

University of Pisa, Department of Physics, Pisa (I)

Project: *Gauge Invariant Charged Fields in Quantum Electrodynamics*

Supervisor: Dr. E. D'Emilio

RESEARCH PROJECTS

Scientific Responsibility and Management of International Projects

Research Project: *Empirically grounded agent based models for the future ATM scenario (ELSA)*
(SESAR JU) Coordinator: Simone Pozzi (Deep Blue - Italy). Contract Reference: 10-220719-C18
Local Coordinator: Dr. **Salvatore Micciché** (Member of the project *Steering Committee*)
Period: May 2011-February 2014
<http://complexworld.eu/wiki/ELSA>
http://www.sesarju.eu/sites/default/files/documents/WPE/calls/ELSA_WP_E_new.pdf
Budget of Palermo Unit: Euro 140692.14; Project Budget: Euro 678893,94.

Research Project: *Empirically grounded agent based models for the future ATM scenario (ELSA) – Extension after evaluation*
(SESAR JU) Coordinator: Marco Ducci (Deep Blue - Italy). Contract Reference: 10-220719-C18 extended contract
Local Coordinator: Dr. **Salvatore Micciché** (Member of the project *Steering Committee*)
Period: July 2014-June 2015
<http://complexworld.eu/wiki/ELSA>
http://www.sesarju.eu/sites/default/files/documents/WPE/calls/ELSA_WP_E_new.pdf
Budget of Palermo Unit: Euro 26000,00; Budget Progetto: Euro 104500,00

Research Network: *Complex World Network: mastering complexity safely - Extension after evaluation*
(SESAR JU) Coordinator: Paula Lopez (Innaxis - Spain) Contract Reference: 10-220210-C3 extended contract
Local Coordinator: Dr. **Salvatore Micciché**
Period: January 2015 – December 2016
<http://www.complexworld.eu>
Budget of Palermo Unit: Euro approx 10000,00; Budget Progetto: Euro approx 130000,00

Scientific Responsibility and Management of Local Projects

October 2010 **Principal Investigator of the research project funded by UNIPA CORI2010 – azione D**
Title: *Funds for inviting the foreign scholar Sandro Wimberger (Heidelberg)*
University of Palermo, Palermo (I)

January 2009 **Principal Investigator of the research project funded by CRRNSM (AF 2007)**
Title: *Gene Ontology statistical investigation of complex diseases*
University of Palermo, Palermo (I)

April 2003 **Young Researchers Project**
University of Palermo, Palermo (I)
Project: *Study of Stochastic Processes with multiple Timescales in Complex Systems*
Scientific Tutor: Prof. Rosario N. Mantegna

Participation in International Projects

Research Network: *Complex World Network: mastering complexity safely*
(UE SESAR JU) Coordinator: Innaxis (Spain) Contract Reference: 10-220210-C3
Local coordinator: Fabrizio Lillo
Period: July 2010 – December 2014
<http://www.complexworld.eu>

Research Project: *Complexity Research Initiative for Systemic InstabilitieS (CRISIS)*
(UE STREP – FP7) Coordinator: Prof. Domenico Delli Gatti (Italy)
Local coordinator: Prof. R. N. Mantegna
Period: October 2011 – October 2014
<http://www.crisis-economics.eu> http://database.crisis-economics.eu/users/sign_in

Research Project: *New tools in the credit network modeling with agents' heterogeneity (NETHET)*
(INET - USA) Coordinator: Prof. R. N. Mantegna
Local coordinator: Prof. R. N. Mantegna
Period: September 2011- September 2013
<http://ineteconomics.org/grants/new-tools-credit-network-modeling-heterogenous-agents>

Coordination Action: *General Integration of the Applications of Complexity in Science (GIACS)*
(UE – NEST FP6) Coordinator: Prof. S. Solomon
Local coordinator: Prof. R. N. Mantegna
Period: July 2005- July 2008

Research Project: *Human behaviour through dynamics of complex social networks: an interdisciplinary approach (DYSONET)*
(UE – NEST FP6)
Coordinator: Prof. P. Argyrakis
Local coordinator: Prof. R. N. Mantegna
Periodo: December 2004- December 2007
<http://dysonet.physics.auth.gr>

Participation in National Projects

Strategic Project: *High Frequency Dynamics in Financial Markets.*
(MIUR)
National coordinator: Prof. R. N. Mantegna (University of Palermo, Italy)
Local coordinator: Prof. R. N. Mantegna (University of Palermo, Italy)
http://ocs.unipa.it/sito-strategico/Home_Page_Ita.htm

Italy-Spain Project: *Mesoscopics of a stock market.*
(MIUR)
National coordinator: Prof. R. N. Mantegna
Local coordinator: Prof. R. N. Mantegna

FIRB (MIUR): *Cellular Self-Organizing nets and chaotic nonlinear dynamics to model and control complex system.*
National coordinator: Prof. L. Fortuna (University of Catania, Italy)
Local coordinator: Prof. R. N. Mantegna (University of Palermo, Italy)
<http://www.firb-complexity.dees.unict.it>

FISR (MIUR): *Un nuovo approccio al drug-design: dalla meccanica statistica allo screening di farmaci antivirali.*
National coordinator: Prof. P. Carloni (SISSA, Trieste)
Local coordinator: Prof. R. N. Mantegna (University of Palermo, Italy)

RESEARCH PROTOCOLS

Promoter of the " Research Protocol for the implementation of activities of common interest " signed between the Department of Physics and Chemistry of the University of Palermo, Department of Economics , Business and Statistics of the University of Palermo and the Prosecutor's Office of Palermo . The Convention was signed on 07/02/2014 and is valid for five years.

Coordinator for the Department of Physics and Chemistry of the University of Palermo of the above Research Protocol.

RESEARCH ACTIVITY

The research activities have dealt with the study of complex socio-economic, medical, biological, biotechnological and environmental with applied physics methodologies borrowed from Statistical Physics , the Physics of Complex Systems and the Theory of Networks .

The research conducted on these complex systems consist in *(i)* a part of data analysis in which techniques such as for example data mining, clustering or community detection are developed and used and *(ii)* a modeling activity performed , for example, by using differential equations, stochastic processes and/or agent based models. This modeling activity is often conducted using numerical simulations of the considered model , whenever the model can not be solved analytically .

Analysis and modeling of economic and financial systems

I analyzed and modeled the univariate and multivariate statistical properties of stock prices volatility and of firms' growth rates, the relationships between banks operating in a specific market and the interbank credit relations between banks and firms. I also studied the role of news , e.g. exogenous sources of information, in determining the evolution of a complex system model such as that constituted by the financial markets.

Analysis and modeling of biological and environmental systems

The applications in the medical, biological and biotechnological field deal with the search of sets of genes over-represented in a statistically significant manner in the metabolic processes of patients affected by complex pathologies such as, for example, autism .

The environmental applications deal with the statistical and network analysis of specific indicators in order to detect statistically robust elements of pollution in the marine environment .

A recent interest concerns the statistical characterization of patients with various forms of psychiatric disorders.

Analysis and modeling of socio-technical systems

In this field, the research is aimed at creating an empirically grounded model agent for the air traffic management, in order to perform numerical scenario simulations related to the upcoming implementation of the new rules of traffic management which is required in view of the exponential increase in air traffic which is expected to occur over the next 20 years. This research uses confidential data provided by Eurocontrol, the European Agency for the supranational control of air traffic.

Analysis and modeling of social systems

The applications in this field relate to the quantitative analysis of the relationships between subjects belonging to the same social group and the way in which these interactions can possibly depend on the fact of being mediated by a specific technological means, such as, for example, in the case of interactions among mobile phone users.

A recent interest concerns the statistical characterization of the subjects investigated/convicted for Mafia crimes in the judicial district of Palermo (see S-01). More generally, the analysis and modeling aimed to investigate quantitatively the role of interactions between family and economic relationships in determining the criminal career of persons belonging to mafia organizations. This research uses confidential data provided by the Prosecutor's Office of Palermo, in an anonymous form, as part of a special research protocol between the Department of Physics and Chemistry and the Prosecutor's Office.

Techniques and modeling methodologies

The approach of applied physics to the study of specific complex systems often poses problems of theoretical nature that may require the development of new techniques and methodologies to be applied to the systems of interest. The publications that refer to this research theme are classified into:

- Methodologies that use concepts of Theory of Networks.
- Methodologies that use concepts of Stochastic Processes.

SCIENTIFIC COLLABORATIONS

M. Barbagallo (Università di Palermo e Azienda Ospedaliera Universitaria Policlinico "Paolo Giaccone", Palermo, Italia)

The project concerns the statistical characterization of communities of individuals observed in a cohort of participants in a research project aimed at identifying the determinants of successful aging.

A. Buchleitner (Albert-Ludwigs University of Freiburg, Freiburg, Germany)

The project involves the characterization of quantum Hamiltonians who have a Survival Probability with power law decaying tails.

F. Calì (IRCCS Oasi Maria SS, Troina, EN)

The research activities carried out in collaboration with Prof. Calì concern the statistical characterization of specific genetic mutations in a cohort of patients suffering from phenylketonuria or mild hyperphenylalaninemia.

A. Cook (Westminster University, London, UK)

The research activities carried out in collaboration with Prof. Cook concern the application of techniques and methodologies typical of network theory and complex systems theory in the study of the air traffic socio-technical complex system.

Y. Fujiwara (University of Hyogo, Kobe, Japan)

The research activities carried out in collaboration regard the characterization of the credit relationships between banks and firms. Currently the research is carried out on a special datasets made available by NIKKEI (Japan).

M. Gallegati (Università Politecnica delle Marche, Ancona, Italia)

The research activities carried out in collaboration with Prof. Gallegati regard the characterization of the credit relationships between banks and firms. Currently the research is carried out on a special datasets made available by NIKKEI (Japan) and to which we have access through Japanese colleagues within the European project FP7 FOC- Forecasting Financial Crisis. In the past we had the chance to work also on Italian data held by the Bank of Italy, as part of INET project *New tools in the credit network modeling with agents' heterogeneity*.

D. La Barbera (Università di Palermo e Azienda Ospedaliera Universitaria Policlinico "Paolo Giaccone", Palermo, Italia)

The collaboration regards various projects having as a common denominator the statistical characterization of patients with various forms of psychiatric disorder using methods of Statistical Physics and Complex Systems. The research has as its aim to investigate the role of the interaction between social factors and clinical evolution of psychiatric disorders..

G. Iori (City University, London, UK)

The research project is the analysis of the properties of network of banks operating in the *Electronic Interbank Market of Deposits* (e-MID).

J. Kertesz (Budapest University of Technology and Economics and Central European University, Budapest, Hungary)

The joint research activities concern the study of the structure of the social network made up of the mobile phone users. In particular we are interested in investigating the presence of elementary structures of the network, such as 3-motifs, which can provide guidance on the articulation and temporal evolution of the user community.

G. Lamura (IRCCS INRCA - Istituto Nazionale di Riposo e Cura per Anziani, Ancona, Italia)

The project concerns the statistical characterization of communities of individuals observed in a cohort of participants in a research project aimed at identifying determinants of successful aging.

J. T. Lunardi (Universidade Estadual de Ponta Grossa, Ponta Grossa, Brasile)

The project involved the analysis of firms growth rates. In particular, our research concerns the role of cross-correlations between companies in determining some of the stylized facts observed in the distribution of the firms logarithmic growth rates.

M. Marsili (ICTP, Trieste, Italy)

I worked with Prof. Marsili to a project concerning the comparison of different clustering techniques in the study of the network properties of shares traded in a financial market.

J. Masoliver (Universitat de Barcelona, Barcelona, Spain)

I worked on a project concerning the statistical characterization of the first passage times in the time series of the returns of shares traded in a financial market. This analysis may be significant for the construction of suitable risk indicators for specific financial products.

J. Piilo (University of Turku, Turku, Finland)

The project concerns the analysis of the properties of the investment portfolios of Finnish banks. The study uses a database containing, in anonymised form, the information relative to the profiles of individual investors operating in the Nordic Market Exchange.

D. Rivas (Universidad de Sevilla, Sevilla, Spagna)

The research activities carried out in collaboration with Prof. Rivas concern the application of techniques and methodologies typical of network theory and complex systems theory in the study of the air traffic socio-technical complex system.

V. Romano (Università degli Studi di Palermo, Palermo, Italia)

I worked on a project on the statistical and ontological analysis of data obtained from microarray experiments performed on patients affected by autism.

S. Wimberger (Università di Parma, Parma, Italia)

The project involves the characterization of quantum Hamiltonians who have a Survival Probability with power law decaying tails.

M. Zanin (Innaxis, Madrid, Spagna)

The research activities carried out in collaboration with Dr. Zanin concern the application of techniques and methodologies typical of network theory and complex systems theory in the study of the air traffic socio-technical complex system.

W.-X. Zhou (East China University of Science and Technology, Shanghai, China)

The joint research activities related to the study of the structure of the social network made up of the mobile phone users. In particular we are interested in investigating how the social relationships are characterized by the fact of being mediated by a specific technological means, in this case the mobile telephone.

ACADEMIC AWARDS

In the session 2012 of the *Procedure of the National Scientific Qualification* I got the Abilitation for Associate Professor in the 02/B3 sector (Applied Physics).

For the italian *VQR 2011/2014* assessment were presented two products that have obtained the following evaluation:

- 1) Community characterization of heterogeneous complex systems.** M. Tumminello, S. Miccichè, F. Lillo, J. Piilo, J. Varho, R.N. Mantegna, *JSTAT*, P01019, (2011) IF: 1.727; citations: 21; VQR Evaluation: 1 (*Excellent*)
- 2) Statistically validated networks in bipartite complex system.** M. Tumminello, S. Miccichè, F. Lillo, J. Piilo, R. N. Mantegna, *PLoS ONE*, 6 (9), e223377, (2011). IF: 4.092; citations: 31; VQR Evaluation: 0.70 (*High*)

For the italian *VQR 2004/2010* assessment were presented three products all of whom have obtained the evaluation of *Excellent*:

- 1) Spanning Trees and bootstrap reliability estimation in correlation based networks.** M. Tumminello, C. Coronello, F. Lillo, S. Miccichè, R. N. Mantegna, *IJBC*, 17, 2319-2329, (2007). IF: 0.910; citations: 45; VQR Evaluation: 1 (*Excellent*)
- 2) Scaling and data collapse for the mean exit time of asset prices.** M. Montero, J. Perello, J. Masoliver, F. Lillo, S. Miccichè, R. N. Mantegna, *Phys. Rev. E*, 72, 056101, (2005). IF: 2.418; citations: 26; VQR Evaluation: 1 (*Excellent*)
- 3) Networks of equities in financial markets.** G. Bonanno, G. Caldarelli, F. Lillo, S. Miccichè, N. Vandewalle, R. N. Mantegna, *Eur. Phys. J. B*, 38, 363-371, (2004). IF: 1.426; citations: 97; VQR Evaluation: 1 (*Excellent*)

AWARDS

The publication "M. Tumminello, S. Miccichè, J. Varho, J. Piilo, R. N. Mantegna, *Quantitative analysis of gender stereotypes and information aggregation in a national election*, *PLoS ONE*, 8 (3), e58910, (2013)" was the subject of an article appeared on *Il Sole 24 Ore* 04/07/2014 signed by Sylvie Coyaud and entitled "Affinità tra elette. È la legge di Condorcet".

The publication "L. Tranchina, S. Miccichè, A. Bartolotta, R. N. Mantegna, M. Brai, *Posidonia oceanica as a historical monitor device of lead concentration in marine environment*, Environ. Sci. Technol., **39 (9)**, 3006-3012, (2005)" is cited in the document **Habitats in Danger** edited by *Oceana*. *Oceana* is one of the largest nonprofit organizations active in the field of conservation and protection of the oceans. http://oceana.org/sites/default/files/reports/habitats_in_danger_dec2006_ENG.pdf

BIBLIOMETRIC INDICATORS (data updated on 24/04/2017)

Bibliometric data:	WoS	Scopus
<i>Number of publications</i>	46	45
<i>Total number of citations</i>	639	679
<i>Average number of citations per article</i>	13.89	15.09
<i>Maximum number of citations per article</i>	156	159
<i>Total number of citations without self-citations</i>	573	624
<i>Average number of citations per article without self-citations</i>	12.46	13.87
<i>Maximum number of citations per article without self-citations</i>	-	155
<i>Total Impact Factor</i>	73.50	-
<i>Average Impact factor per article</i>	1.60	-
<i>Maximum Impact factor per article</i>	5.58	-
<i>H-index</i>	12	12

Citations	per year	(WoS data - Core Collection)	
2016	104	2011	48
2015	77	2010	42
2014	63	2009	37
2013	61	2008	37
2012	69	2007	42

Citations	per year	(Scopus data)	
2016	99	2011	53
2015	87	2010	46
2014	72	2009	37
2013	74	2008	40
2012	77	2007	40

WoS Data- for the period 2012-2016 the average number of citations per year amounted to 74.8 and the standard deviation was equal to 17.5 ; in 2007-2011 the average number of citations per year amounted to 41.2 and the standard deviation was equal to 4.5.

Scopus Data - for the period 2012-2016 the average number of citations per year amounted to 81.8 and the standard deviation was equal to 11.2 ; in 2007-2011 the average number of citations per year amounted to 43.2 and the standard deviation was equal to 6.4.

Impact Factor – The IF used for publications in 2016 and 2017 is the 2015 one.

INVITED TALKS in WORKSHOPS and CONFERENCES

February 2017 "Problems in discrete dynamics", 17/02/2017, Arcidosso (SI), Italy.

Title: *An empirically grounded agent based model for modeling direct, conflict detection and resolution operations in Air Traffic Management*

October 2013 "11th International Symposium on Financial Systems Engineering", 19/10/2013, Shanghai, China.

Title: *Network investigation of bank-firm credit relationships: the Japanese and Italian case*

CONTRIBUTED TALKS in WORKSHOPS and CONFERENCES

December 2015 Workshop "Fifth SESAR Innovation Days", 01-03/12/2015 Bologna (I)

Title: *ELSA Air Traffic Simulator: an Empirically grounded Agent Based Model for the SESAR scenario*

June 2015 International Conference on Computational Social Science, 08-11/06/2015 Helsinki (ES)

Title: *An Agent based Model of Air Traffic management*

June 2015 International Conference on Computational Social Science, 08-11/06/2015 Helsinki (ES)

Title: *Statistically validated mobile communication networks: Evolution of motifs in European and Chinese data*

September 2013 Workshop "COMPUTATIONAL SOCIAL SCIENCE: from Social Contagion to Collective Behaviour", Satellite of ECCS'13, 19/09/2013 Barcelona (ES)

Title: *Quantitative Analysis of Gender Stereotypes and Information Aggregation in a National Election*

July 2013 Workshop "Interlinkages and Systemic Risk", 04-05/07/2013 Ancona

Title: *Quantitative Analysis of Gender Stereotypes and Information Aggregation in a National Election*

November 2011 Workshop "SESAR Innovation Days", 29-30/11/2011 Toulouse (F)

Title: *Toward a complex network approach to ATM delays analysis*

- Aprile 2008** **GIACS Conference " Data in Complex Systems"**, Palermo (I)
Title: *Different levels of information in financial data: an overview of some widely investigated databases*
- Marzo 2008** **Workshop "Appunti di Fisica Teorica II"**, Messina (I)
Title: *Empirical characterization and modeling of complex systems: data investigation and theoretical tools*
- September 2007** **Workshop " Biophys 07"**, Arcidosso (I)
Title: *A Gene Ontology Analysis of patients affected by autism disease*
- October 2006** **Workshop " EXtreme EVents in Complex Dynamics"**, Dresden (DE)
Title: *Characterization of power-law correlated stationary markovian stochastic processes in terms of multiscale ones*
- October 2004** **Workshop "Volatility of financial markets: theoretical models, forecasting and trading"**, Leiden (NL)
Title: *A Markovian Stochastic Volatility Model with Multiple Time-Scales*
- November 2003** **University of Siena, Department of Political Economics "R. Goodwin"**, Siena (I)
Workshop "High frequency data in finance",
Talk: *Minimum Spanning Trees of Price Returns and Volatility*
- July 2003** **Workshop "Phisicists in Finance"**, Milano (I)
Title: *The master in Quantitative Finance at the University of Palermo*
- November 2002** **The Second Nikkei Econophysics Research Workshop and Symposium**, Tokio (JP)
Title: *Stochastic Volatility Model based on a Nonlinear Langevin Equation*
- December 1997** **GR15 - 15th International Conference on General Relativity and Gravitation**, Pune (India)
Title: *Physical Properties of Gravitational Solitons*
- June 1997** **INFN - Convegno Informale di Fisica Teorica delle Particelle Elementari**, Como (I)
Title: *Differenze nel Comportamento Infrarosso tra i Campi Carichi Gauge Invarianti di QED e QCD: un Calcolo a 2 loop*

SEMINARS

- May 2013** **University of Firenze, Department of Physics and CNR-ISC**, Firenze (I)
Seminar: *Statistical characterization of communities in a social system: the elected in the finnish 2011 elections*
- April 2013** **Central European University, Center for network Science**, Budapest (H)
Seminar: *A statistical investigation on a socio-medical complex system: some prisoners for Mafia crimes in Palern*
- November 2009** **Heidelberg University, ITP**, Heidelberg (D)
Seminar: *Methodological issues in the gene ontology statistical investigation of complex diseases*
- October 2006** **Workshop "SPIAM - Meeting on Quantitative Finance"**
Seminar: *Mean Exit Times of Equity Assets*
- June 2006** **ICTP**, Trieste (I)
Seminar: *Mean Exit Times and Survival Probability of Equity Assets*
- December 2003** **University of Palermo, Department of Statistical and Economical Sciences**, Palermo (I)
Seminar: *Stationary Markovian Stochastic Processes with Multiple Timescales*
- January 2003** **University of Firenze, Department of Energetics**, Firenze (I)
Seminar: *Long-Range Correlated Stationary Markovian Processes*
- October 2002** **University of Pisa, Department of Physics**, Pisa (I)
Seminar: *Econophysics: some research themes and methodologies*
- November 1999** **The University of Plymouth, Department of Mathematics and Statistics**, Plymouth (UK)
Seminar: *The Infrared Problem and Gauge Invariant Charged Fields*
- November 1999** **University of Southampton, Faculty of Mathematical Studies**, Southampton (UK)
Seminar: *Soliton Solutions with Real Poles in the Alekseev Soliton Technique*
- November 1999** **Queen Mary and Westfield College, School of Mathematical Sciences**, London (UK)
Seminar: *Soliton Solutions with Real Poles in the Alekseev Soliton Technique*

October 1999 **University of Roma TRE, Department of Physics, Roma (I)**
Seminar: *Soliton Solutions of Einstein-Maxwell's Equations*

April 1999 **University of Pisa, Department of Physics, Pisa (I)**
Seminar: *Physical Properties of Gravitational Solitons: Electromagnetic Solitons*

INSTITUTIONAL ACTIVITIES

2011-2013: Member of the University Scientific Committee for Physics. This is a consultancy committee that also provides the scientific criteria for the assignment of the university budget for the local research projects.

March 2012-February 2013: Vice-Director of the Specialization School in Medical Physics of the University of Palermo.

Since 2013/2014: Coordinator of Semester (I year, I semester) within the Degree in Medicine and Surgery, University of Palermo

DEPARTAMENTAL INSTITUTIONAL ACTIVITIES

Since 15/11/2016 *Head of the Teaching Quality Assurance Committee* of the Department of Physics and Chemistry of the University of Palermo

Since 12/11/2015 *Delegate to Teaching Activities* of the Department of Physics and Chemistry of the University of Palermo

since 2013 *Head of the Laboratorio Computazionale di Sistemi Economici e Sociali* of the Dipartimento di Fisica e Chimica

2013-2014 Member of the Board of Doctorate in Physical Sciences of the University of Palermo.

2004-2014 Member of the Board of Doctorate in Applied Physics of the University of Palermo.

INSTITUTIONAL TEACHING ACTIVITY

The teaching activities carried out within the University of Palermo and certified in the Register of Activity Teaching available at the Dean of the Faculty of Medicine, were carried out continuously from academic year 2004/2005 to date and have always exceeded 350 hours with the exception of academic year 2004/2005 . The activity has covered:

DEGREE COURSES

Since 2006/2007 to date University of Palermo, Faculty of Medicine and Surgery
2nd level degree in "*Medicina e Chirurgia*"
Course: Physics – 60 hours

Since 2014/2015 to date University of Palermo, Faculty of Fundamental and Applied Sciences
1st level degree in "*Physical Sciences*"
Course: Physics – 72 hours

Since 2014/2015 University of Palermo, Faculty of Medicine and Surgery
1st level degree in "*Technician in Psychiatric Rehabilitation*"
Course: Physics – 40 hours

2013/2014 University of Palermo, Faculty of Medicine and Surgery
1st level degree in "*Logopedia*"
Teaching Module: Physics – 40 hours

2009/2010 University of Palermo, Faculty of Medicine and Surgery
1st level degree in "*Ostetricia*"
Course: Physics – 40 hours

2005/2006 University of Palermo, Faculty of Medicine and Surgery
1st level degree in "*Igiene Dentale*"
Course: Physics (I semestre)

2005/2006 University of Palermo, Faculty of Medicine and Surgery
1st level degree in "*Igiene Dentale*"
Course: Applied Physics (II semestre)

2005/2006	University of Palermo, Faculty of Medicine and Surgery 1 st level degree in " <i>Ortottica ed Assistenza Oftalmologica</i> " Course: Physics
2005/2006 2004/2005	University of Palermo, Faculty of Medicine and Surgery 1 st level degree in " <i>Ortottica ed Assistenza Oftalmologica</i> " Course: Optics
2002/2003	University of Palermo, Faculty of Medicine and Surgery 1 st level degree in " <i>Technician in Psychiatric Rehabilitation</i> " Course: Physics
Since 2011/2012 to 2012/2013	University of Palermo, Faculty of Medicine and Surgery Optional Course (cod. 14811) "Statistical Physics in Biological Systems" – 24 hours

SPECIALIZATION SCHOOL COURSES

from 2010/2011 to 2013/2014	University of Palermo, Faculty of Medicine and Surgery Specialization School in Medical Physics Course: "Statistical Physics in Biological Systems" – 24 hours
from 2006/2007 to 2009/2010	University of Palermo, Faculty of Medicine and Surgery Specialization School in Medical Physics Course: "Bioinformatics"

PhD COURSES

2014/2015	University of Palermo, Department of Physics and Chemistry PhD School in Physical Sciences Course: Stochastic Processes
2013/2014	University of Palermo, Department of Physics and Chemistry PhD School in Physical Sciences Course: Stochastic Processes Course: Statistical Physics in Biological Systems
2006/2007 2007/2008	University of Palermo, Department of Physics and Related Technologies PhD School in Applied Physics Course: Bioinformatics

NON INSTITUTIONAL TEACHING ACTIVITY

2013/2014	University of Palermo PON MED-CHHAB - " <i>Specialist course for Genomics and Proteomics Applied to Bioinformatics</i> " Course 1: Stochastic Processes Course 2: Gene ontology and statistical analysis
Since 2011/2012 to 2012/2013	University of Palermo 2 nd level Master in " <i>Applied biotechnologies and bioinformatics for the study and diagnosis of genetic diseases</i> " Course 1: Stochastic Processes Course 2: Gene ontology and statistical analysis

NON INSTITUTIONAL TEACHING ACTIVITY in other UNIVERSITIES

2003/2004	University of Siena, Department of Mathematical and Information Technology Sciences "R. Magari" 1 st level Master in " <i>Bioinformatics</i> " "Alberto Del Lungo" Course: Probabilistic Models
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TUTORING ACTIVITY

Postdocs

2012-2013 Scientific Tutor of Dr. Stefania Vitali,

Post-doc, Department of Physics, University of Palermo.

Research Project: "*Development of a database, data analysis and realization of an empirically grounded Agent Based Model of the future SESAR scenario of the Air Traffic Management*".

2012-2013 Scientific Tutor of Dr. Marco Cipolla,

Post-doc, Department of Physics, University of Palermo.

Research Project: "*Development of a database and data analysis for the realization of an empirically grounded Agent Based Model of the future SESAR scenario of the Air Traffic Management*".

PhD Students

2014-2017 Scientific Tutor of Dr. Christian Bongiorno,

PhD School in Physical Sciences (XXIX ciclo), Dipartimento di Fisica e Chimica of the University of Palermo.

Research Project: "*Empirically grounded Agent-Based models for modeling socio-economic and socio-technical complex systems*".

2006-2008 Scientific Tutor of Dr. Claudia Coronello,

PhD School in Applied Physics, Department of Physics and Related Technologies, University of Palermo.

Research Project: "*Analysis of correlations between genes and between microRNAs with methods of clustering analysis applied to microarray*".

Studentships

2013 Scientific Tutor of Dr. Giovanni Affronti,

Studentship at Department of Physics and Chemistry, University of Palermo.

Research Project: "*Statistical analysis on an empirically grounded Agent Based Model of the future SESAR scenario of the Air Traffic Management*"

2013 Scientific Tutor of Dr. Christian Bongiorno,

Studentship at Department of Physics and Chemistry, University of Palermo.

Research Project: "*Realization and development of an empirically grounded Agent Based Model of the future SESAR scenario of the Air Traffic Management*"

2005 Scientific Tutor of Dr. Claudia Coronello,

European Project DYSONET. call INFM n. 974.

Research Project: "*Human behaviour through the dynamics of complex social networks*".

Specialization School Students

2013 University Tutor of Dr. Gaetano Arnetta,

Specialization School in Medical Physics of the University of Palermo.

Research Project: "*Acceptance and commissioning of the TomoTherapy Hi-Art*". Hospital Tutor: Dr. G. Iacoviello.

Master Degree Students

2013 Co-Tutor of Dr. Chiara Caprì,

Master Thesis, Faculty of Medicine and Surgery, University of Catania.

Research Project: "*Evaluation of psychopathy indices in subjects convicted for Mafia crimes*". Tutor: Prof. Daniele La Barbera.

2012 Scientific External Tutor of Dr. Christian Bongiorno (in collaboration with: Rosario N. Mantegna),

Master Thesis, Department of Physics, University of Catania.

Research Project: "*Complex Network Structure of Financial News*". Tutor: Prof. Vito Latora.

VISITING PERIODS

15-19 November 2009 - Complex Dynamics in Quantum Systems, Institut fuer Theoretische Physik, Universitaet Heidelberg

12-16 June 2006 - ICTP, Condensed Matter & Stat.Phys. Section, Trieste, Italy.

15-23 September 2004 - Departament de Fisica Fonamental Universitat de Barcelona, Barcelona, Spagna

May 2002 - Max-Planck-Institut fur Physik komplexer Systeme, Dresden, Germany

PEER REVIEW ACTIVITY

Journals

Peer review for the international journals: Physical Review Letters, Physical Review E, Physical Review X, European Physical Journal B, New Journal of Physics, Physica A, Physica D, International Journal of Theoretical and Applied Finance, Communications in Nonlinear Science and Numerical Simulations.

Research Projects

Peer review activities carried out on behalf of the Ministry of Education in relation to a project submitted in response to PRIN 2012.

ORGANIZATIONAL ACTIVITY

Member of the Local Organizing Committee of the “*Italian National Conference on Condensed Matter Physics FISMAT2015*” held in Palermo, 27 September-02 October 2015

Member of the Organizing Committee of the Satellite Meeting “*Complexity Science and Transportation Systems ‘15*” held within the Lipari School on Complex Systems 2015, Lipari, July 12-18, 2015

Member of the Organizing Committee of the Satellite Meeting “*Complexity Science and Transportation Systems ‘14*” held within the 11th European Conference on Complex Systems ECCS’14, Lucca, September 22-26, 2014

Member of the Local Organizing Committee of the Meeting “*Interlinkages and Systemic Risk*” held in Ancona, July 4-5, 2013

Member of the Organizing Committee of the Satellite Meeting “*Complexity Science and Transportation Systems ‘13*” held within the 10th European Conference on Complex Systems ECCS’13, Barcelona, September 16-20, 2013

Member of the Local Organizing Committee of the Focused Workshop “*Large databases in social and economic complex systems*” held as *Satellite Conferences* within the 5th European Conference on Complex Systems, Jerusalem, September 14-19, 2008

Member of the Local Organizing Committee of the Focused Workshop “*Large databases in biomedical complex systems*” held as *Satellite Conferences* within the 5th European Conference on Complex Systems, Jerusalem, September 14-19, 2008

Member of the Local Organizing Committee of the GIACS Conference “*Data in Complex Systems*”, Palermo (Italy), 7-9/04/2008

Member of the Local Organizing Committee of the 4th Cost P10 Meeting 2007, Terrasini (PA), 21-23/09/2007

PARTECIPATION to COMMITTEES

PhD and Specialization School

2016 Component of the Admission Committee of the International PhD in Physics (XXXII cycle) of the Palermo University, University of Palermo, D.R. 3491/2016, 20/09/2016.

2013 Component of the Evaluation Committee for the Final Examination of the Specialization School in Medical Physics, University of Palermo, D.R. 2091/2013, 08/07/2013.

2012 Component of the Evaluation Committee for the Final Examination of International PhD in Applied Physics of the Palermo University.

2010 Component of the Admission Committee of the International PhD in Applied Physics (XXIII cycle) of the Palermo University.

2010 Component of the Admission Committee for the Specialization School in Medical Physics of the Palermo University.

2009 Component of the Admission Committee for the Specialization School in Medical Physics of the Palermo University.

Postdocs, Studentships and research collaborations

2015 Member of the Evaluation Committee for a studentship: “*Study of complex systems with methods of science networks and agent-based models*”, call 2945/2015, 14/09/2015. Supervisor: Prof. R. N. Mantegna.

2014 Member of the Evaluation Committee for a postdoc position: “*Empirical analysis of the credit bank-bank and bank-firm networks and implementation of an agent based model empirically grounded on the observed statistical regularities*”. call DR n.

2975/2014, 08/08/2014. Supervisor: Prof. F. Lillo.

2014 Member of the Evaluation Committee for a Research Collaboration., prot. n. 1967, 08/10/2014. Supervisor: Prof. G. Raso.

2014 Member of the Evaluation Committee for a studentship: "*Multi-sector development of an empirically grounded Agent Based model for the management of the air traffic system in the new SESAR scenario*", call 47538, 03/07/2014. Supervisor: Prof. S. Miccichè.

2014 Member of the Evaluation Committee for two studentships "*Standardization of database diagnostic analog and digital mammography for use on DATA WAREHOUSE*" and "*Integration and management of data warehouse metadata from diagnostic digital Databases*", nomination decree prot. n. 79, 15/01/2014. Supervisor: Prof. G. Raso.

2013 Member of the Evaluation Committee for a studentship: "*Stochastic models of predictive microbiology for the study of bacterial growth in fishery products*", call D.R. 3891, 28/11/2013. Supervisor: Prof. D. Valenti.

2013 Member of the Evaluation Committee for a postdoc position: "*Empirical Analysis of the boank-bamk and bank-firm credit relationships and implementation of an agent based model based on the detected empirical regularities*". call DR n. 2604/2013, 04/09/2013. Supervisor: Prof. R. N. Mantegna.

2013 Member of the Evaluation Committee for a Research Collaboration position on: "*Statistical Analysis on an empirically grounded Agent Based Model of the future SESAR scenario of the Air Traffic Management*", call n. 2291 del 11/09/2013. Supervisor: Prof. S. Miccichè.

2013 Member of the Evaluation Committee for a position a Tecnologist, call D.R. 1653, 03/06/2013. Supervisor: Prof. G. Raso.

2013 Member of the Evaluation Committee for a Research Collaboration position on: "*Development of an empirically grounded Agent Based Model of the future SESAR scenario of the Air Traffic Management*", call n. 2136 del 02/08/2013. Supervisor: Prof. S. Miccichè.

2013 Member of the Evaluation Committee for a Studentship: "*Realization of an empirically grounded Agent Based Model of the future SESAR scenario of the Air Traffic Management*", call n. 664, 18/03/2013. Supervisor: Prof. S. Miccichè.

2013 Member of the Evaluation Committee for a postdoc position: "*Empirical Analysis of the boank-bamk and bank-firm credit relationships and implementation of an agent based model based on the detected empirical regularities*". call DR n. 1710/2013, 10/06/2013. Supervisor: Prof. R. N. Mantegna.

2012 Member of the Evaluation Committee for a postdoc position: "*Description of the financial system by mean of an Agent Based model and development of the relative software*". call DR n. 488, 09/02/2012. Supervisor: Prof. R. N. Mantegna.

2012 Member of the Evaluation Committee for a postdoc position: "*Retrospective accidental dosimetry on workers and population*". call DR n. 487, 09/02/2012. Supervisor: Prof. M. Brai.

2011 Member of the Evaluation Committee for a postdoc position: "*Applicazioni di tecniche di analisi di struttura della materia a materiali di vario tipo*". call DR n. 3174, 07/10/2011.

2011 Member of the Evaluation Committee for a postdoc position: "*New instruments in the modeling of the credit network with heterogeneity of economic agents*". call DR n. 3270, 18/10/2011. Supervisor: Prof. R. N. Mantegna.

2011 Member of the Evaluation Committee for a postdoc position: "*Development of a database and data analysis for the realization of an empirically grounded Agent Based Model of the future SESAR scenario of the Air Traffic Management*". call DR n. 3271, 18/10/2011. Supervisor: Prof. S. Miccichè.

2011 Member of the Evaluation Committee for a postdoc position: "*Development of a database, data analysis and realization of an empirically grounded Agent Based Model of the future SESAR scenario of the Air Traffic Management*". call DR N. 3271, 18/10/2011. Supervisor: Prof. S. Miccichè.

2008 Member of the Evaluation Committee for one postdoc position (Assegno di Ricerca MIUR) at the University of Palermo on the research topic: "*Modelli ad agenti fondati empiricamente di un sistema complesso: strategie e reti di interazione in un Mercato Finanziario*", call DR N. 1101 del 12/03/2008.

2008 Member of the Evaluation Committee for one postdoc position (Assegno di Ricerca) on the project BCNanolab of the University of Palermo, on the research topic: "*Rivelatori e tecniche fisiche applicate ai beni culturali*", call DR N. 933 del 04/03/2008.

2007 Component of the Examination Committee for one postdoc position (Assegno di Ricerca) on the project BCNanolab of the University of Palermo, on the research topic: "*Sviluppo di modelli stocastici predittivi di dinamica di popolazioni ittiche del Mar Mediterraneo*", call DR N. 2907 del 12/06/2007

2007 Component of the Examination Committee for one postdoc position (Assegno di Ricerca MIUR) at the University of Palermo on the research topic: "*Investigation with methods and concepts of statistical physics of a complex evolving system: the financial market*", call DR N. 1516, 28/03/2007

2006 Component of the Examination Committee for two postdoc positions (Assegno di Ricerca MIUR) on the research topic "*Complex networks in social and biological systems*", call INFN n. 21/2006.

2005 Component of the Examination Committee for two studentships on the research topic: "*Human behaviour through the dynamics of complex social networks*", bando INFN n. 974.

LANGUAGES

Italian mothertongue

English fluent (written and spoken)

PERSONAL DATA

Date of Birth 24 June 1969

Place of Birth Taurianova (RC)

Nationality Italian

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I-90128 Palermo (PA)
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I-90141 Palermo (PA)
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