CURRICULUM VITAE

SURNAME AND NAME	**EVANGELISTA, LUIZ ROBERTO**
Nationality	**Brazilian**

Academic Position (if the candidate holds a position in a University)

Qualification/Title	**Professor of Physics (Full)**
University	**Universidade Estadual de Maringá**
Department	**Departament of Physics**
Academic Field	**Theoretical and Mathematical physics**
Academic Discipline	**Statistical physics and soft matter**

Working experience (please use the following table in order to briefly describe the working positions covered by the candidate)

Dates (from .. to..)	**March 1982 - Present**
Name and address of the Employer (Public or/and private institution/body)	**Universidade Estadual de Maringá** **Department of Physics**
Position held (for positions in Universities, the candidate should indicate the Faculty/College/School and the Department)	• **Assistant Professor (1982 - 1991)** • **Associate Professor (1991 – 2001)** • **Full (Ordinary) Professor (2001 - Present)** **All the positions at Departamento de Física, Universidade Estadual de Maringá.**
Main activities/responsibilities	**-Principal researcher** **-Teaching (Statistical physics, Quantum physics, Mathematical physics, and History of Physics, among others).** **-Supervisor of PhD students, MSc students and pos-docs.**

Education and Training (please use the following table to describe Degrees awarded, by only indicating the information concerning Bachelor's Degree, Master of Science's Degree or/and PhD)

Date	**December 1979**
Institution which issued the degree	**Universidade Estadual de Maringá**
Type of Degree awarded (only Bachelor's Degree, Master of Science's Degree, PhD)	**Physics degree (undergraduate)**

Date	**May 13, 1983**
Institution which issued the degree	**Universidade Federal de Santa Catarina, Florianópolis, Brazil**
Type of Degree awarded (only Bachelor's Degree, Master of Science's Degree, PhD)	**Master of Science (Thesis on Fundamendals of Quantum Mechanics)**

Date	**September 14, 1988**
Institution which issued the degree	**Universidade de São Paulo, Instituto de Física**
Type of Degree awarded (only Bachelor's Degree, Master of Science's Degree, PhD)	**Doctor of Science (Ph. D) (Thesis on Superfluidity of Helium-4)**

INTERNATIONAL REFEREES INDICATED BY THE CANDIDATE

Name	Institution of origin	Address	e-mail address
Antal Jakli	**Liquid Crystal Institute**	**Kent State University** **800 E. Summit St.** **Kent, OH 44240**	**ajakli@kent.edu**
Constantino Tsallis	**CBPF – Centro Brasileiro de Pesquisas Física**	**Rua Xavier Sigaud, 150** **22290-180 Rio de Janeiro (RJ), Brazil**	**tsallis@cbpf.br**
Epifanio Virga	**Università degli Studi di Pavia**	**Via Ferata, 5** **27100 Pavia**	**eg.virga@unipv.it**
Peter Palffy-Muhoray	**Liquid Crystal Institute**	**Kent State University** **800 E. Summit St.** **Kent, OH 44240**	**mpalffy@kent.edu**

EVALUATION FIELDS

1. Scientific Activity

1.1 The three most important outcomes/results of the research activity of the candidate accompanied by the tangible and verifiable evidence that the presented results:

- **Ionic adsorption and equilibrium distribution of charges in a nematic cell,** G. Barbero, A. K. Zvezdin, and L. R. Evangelista, Physical Review **59**, 1846 (1999) .

In this paper (paper [142]), we have proposed a general model to face the adsorption phenomena in electrolytic cells, starting our analysis with some application to liquid-crystalline systems. The model may be faced as a self-consistent approach to determine the profiles of the electrical and chemical potentials in confined samples containing mobile ions. This, in turn, enables one to build a complete description of the adsorption of ions in real samples. This paper is the starting point of an entire line of research. Some years after its publication, we have written a book containing the fundamentals of this line and the applications (listed below as Adsorption phenomena and anchoring energy in nematic liquid crystals [109]). In addition, in collaborations with chemical engineers, we have extended the model to investigate isotherms and multiple adsorption in different contexts also in engineering (papers [3], [4], [27], [39], and [65].).

- **Surface Induced Phase Separation and Pattern Formation at the Isotropic Interface in Chiral Nematic Liquid Crystals,** R. S. Zola, L. R. Evangelista, Y. C. Yang, and D. K. Yang, Physical Review Letters **110**, 057801 (2013).

In this paper (paper [43]), we report for the first time in literature the pattern formation of a chiral nematic liquid crystal under a wetting transition. A striped pattern is formed due to the unique properties of the system resulting from interplay between anchoring and elastic anisotropy, and presents also a strong similarity with biological fibrous composites. This theoretical and experimental contribution to the physics of chiral materials comes from our complex fluids group in Brazil, which was joined in the research by important chemists from Liquid Crystal Institute (Kent, Ohio), strongly interested in the molecular organization of this kind of material. This system's dynamics has unprecedented biological analogues for mimicking and recreating synthetic versions of naturally occurring materials. Furthermore, the results found in [43] are strongly directed to applications such as in thermally controlled 2D diffraction gratings, as lithography masks, nano-motors, phtonic devices and so on (see also papers [2], [6], and [8]).

- **Anomalous diffusion governed by a fractional diffusion equation and the electrical response of an electrolytic cell,** P. A. Santoro, J. L. de Paula, E. K. Lenzi, and L. R. Evangelista, The Journal of Chemical Physics **135**, 114704 (2011).

In this paper (paper [54]), we propose a pioneering application of the fractional diffusion equations to the electrochemical impedance technique in which surface effects are taken into account in a very general way. This contribution from our group in Brazil represents a crucial step towards an extension of the Poisson-Nernst-Planck (PNP) model to encompass anomalous diffusion. It shows that the impedance spectroscopy models based on the fractional diffusion equations may be used to build an entire framework of continuum models general enough to analyse impedance data of high complexity. The theoretical model has been widely used to successfully analyse and interpret experimental data. All the conceptual results leading to the proposition of very general PNPA (anomalous PNP) models were presented in the last two chapters of our recently published book (listed as Fractional Diffusion Equations and Anomalous Diffusion, Cambridge University Press, 2018) as an original research lines to be explored in the next years.

1.2 List of the submitted publications (with a maximum number of 20) in addition to those listed at point 1.1. For each publication and/or set of publications, the candidate is required to briefly describe his/her contribution, their scientific/technical significance and individual importance, the overall impact of the results in the international scientific community.

Elastic continuum theory in nematic liquid crystals (papers [30], [64], [74], [76], [80], [89], [98], [102], [103], [106], [111], [112], [119], [123], [124]-[126], [128], [137], [148], [149], [151], [152], [158], [160], [162] [164]-[166], [168], [171]-[173], [175], and [176]). This is a strong investigation line started from the collaboration with Prof. G. Barbero (since 1989) and dedicated to the surface and bulk elastic properties of nematic liquid-crystals. The focus is the molecular orientation of the nematic phase, both in presence and in the absence of static external fields, the bulk and surface-like elastic constants of the nematic phase, mathematical problems raised by the elastic continuum theory (ill- and well- posed variational problems), and the role of the anchoring energy (the meaning of surface energy) on the molecular orientation. I would like to underline the role of paper [165], dedicated to the subsurface deformation in nematic liquid crystals. This paper offers a solution for an important problem in the elastic theory, the so-called Oldano-Barbero paradox, thus contributing to the debate concerning the fundamentals of the elastic theory for nematics as well for the interpretation of the role of the surface energy. The importance of this

block of contributions to the scientific literature was recognized by the invitation made from World Scientific Publishing Co. to write a book dedicated to the elastic theory and its fundamentals. This is represented by our book An Elementary Course on the Continuum Theory for Nematic Liquid Crystals ([137] in the list). The first chapter of this book proposes a large variety of new variational problems in finite-length situations; the second and third chapters discuss the fundamentals of elastic theory and several new applications in real problems; the fourth chapter focuses the molecular models, and the fifth chapter offers a complete view of the subsurface problems and their solutions in the literature of nematic liquid-crystals. This book is used worldwide as a textbook in advanced courses of elastic theory and variational problems.

Molecular organization in liquid crystals: MC simulation and elastic approach (papers [1], [12], [22], [24], [25], [28], [40], [53], [58]). I started a scientific collaboration with the group of Prof. Claudio Zannoni and the INFN – Sezione Bologna (Drs. P. Pasini and C. Chiccoli) in order to combine Monte Carlo simulation results with elastic continuum theory approach to investigate the molecular ordering in confined nematic liquid crystals. We have analyzed several aspects of the problem (role of anchoring energy, elasticity, thickness, external field effects, etc.) in nematic liquid crystals confined in samples in the shape of a slab, but also in a sample formed by the annular region between two concentric cylinders, with several different boundary conditions. We have obtained a series of successful results, culminating in the recently published paper [1], in which we investigate also the role of the molecular biaxiality on the defect created in the centre of a nematic droplet radially anchored at the surfaces. The results obtained in the Monte Carlo study are compared with those obtained from a continuum theory approach. We have shown that the defect core size increases with the increasing of the molecular biaxiality, thus pointing towards the existence of an unpredicted universal behavior. One of my Ph.D. students had a (sandwich-doctorate) period in Bologna and this connection has been strengthened because we (the Brazilian group) were able to combine our expertise in elastic continuum theory with the well-known expertise of Bologna's group.

Surface and elastic properties of lyotropic nematic liquid crystals (papers [113], [143], [144], [150], [154], [155], [157], [163], [167], and [170]). This line of research was opened since our collaboration with the Brazilian experimental group, which is pioneer in the studies of lyotropic liquid crystals. The elastic theory developed by us during the preceding years (and mainly focused on thermotropic liquid crystals), mentioned above, was applied following our suggestions and calculations to promote a first estimation of the anchoring energy of a lyotropic nematic liquid crystal sample, using magnetic field, in paper [170]. As far as we known, this was the first time an estimation of this important parameter was reported for lyotropics using a well-defined elastic continuum approach. Along these lines, the research continued with lyotropics and was dedicated to explore the bulk elastic constants of calamitic and discotic phases of these materials.

Elastic propertis of nematic twist-bend (NTB) phase (papers [7], [9], [11], [19], and [23]). This phase was experimentally discovered only recently, even if theoretically predicted more than four decades ago. It's a phase with a heliconical molecular arrangement, which is potentially applicable in flat screen industry. The elastic description for the phase was proposed by us in the paper [23], using the expertise of our group in the elastic continuum theory of liquid-crystalline materials. Our theory takes into account all the elements of symmetry of a modulated phase and represents a complete continuum description for cholesteric, nematic and NTB phases, among others. Since it has been proposed and presented in a series of events dedicated to this new phase, it has been increasingly considered as a valid and useful tool to investigate stable phases in these systems. Previous approach (e.g., the Dozov's one) required the existence of a negative bend elastic constants, but our model avoids this (probably) artificial scenario. In addition, new elastic parameters are being proposed and coarse-grained versions of these elastic approaches have been developed by us.

Surface effects and pattern formation in nematics and chiral nematics (papers [2], [6], [8], [32], [41], [43], [49], [57], and [62]). This represent a broad investigation line and poses a large class of challenging problems, both from the fundamental point of view as well as from the point of view of practical applications. My group and I in Brazil have applied theoretical mathematical tools to solve a variety of boundary-value problems arising in this context. An important ingredient of this approach is the presence of the surface viscosity; the mathematical problems become more difficult and the experimental investigation is still object of research. In paper [6], for instance, we discuss the role of the surface parameters and the different distortions, focusing also the problem of light transmission. Three different regimes are identified: free twist, stick-slip twist, and constrained twist. We argue that the results obtained may be relevant for liquid crystal active waveplates and for determining surface viscosity and the azimuthal anchoring energy.

Adsorption phenomena of neutral and charged particles in confined isotropic fluids (papers [16], [24], [26], [31], [35], [46], [55], [86], [91], [92], [101], [104], [105], [108], [109], [114]-[118], [121], [122], [127], [131]-[136], [138]-[140], [142], and [147]). In collaboration with G. Barbero, we started an investigation of the role of ions on the anchoring energy of nematic liquid crystals in the late 90's. This problem is of great importance for the operation of displays based on liquid crystals because the presence of charged impurities are responsible for power consumption and other problems (see paper [136]). In paper [142], as discussed in 1.1 above, we have proposed a general self-consistent model to obtain the equilibrium profile of charges and fields in electrolytic cells (a nematic liquid crystal sample is a typical example of a weak electrolyte system). After the proposition of this theoretical model for selective adsorption, we applied (by modifying or improving it accordingly) it to the description of adsorption of ions in general and to the adsorption of neutral particles (e.g., dyes in nematic liquid crystal's samples) in a series of papers of decisive importance. Also this well-succeed set of results permitted us to understand also and to solve an old problem in the liquid-crystalline literature, namely, to explain why the anchoring energy in real samples may depend on the thickness of the sample. The book Adsorption phenomena and Anchoring Energy in Nematic Liquid Crystals ([109]) contains a detailed discussion of the origin and possible sources of anchoring energy in nematic liquid crystals, emphasizing the dielectric contribution to the anchoring energy, in particular. It also provides an account of new and established results spanning three decades of research into the problems of anchoring energy and adsorption phenomena in liquid crystals.

Ion adsorption and Poisson-Boltzmann equation: engineering approach (papers [3], [4], [27], [39], [65]). In a series of papers, starting from [65], a model for selective ion adsorption has been proposed (inspired in the pioneering paper [142] mentioned in 1.1 above) to face adsorption of ions in biological systems (biosorption). I have proposed our paper [142], written originally having in mind an isotropic fluid or a weak electrolyte, as a possible candidate to describe the isotherms and the adsorption process in systems studied by chemical engineers from Maringá (UEM) and Campinas (Unicamp). We have discussed extensively how to modify the original approach to adapt it to the context and language of these applied areas (to handle experimental data coming from food industries and factories of our region) to avoid environmental problems. Besides generating other papers, this kind of approach (with the model we have proposed) has generated at least other three Ph.D. thesis in the Doctoral Program of Chemical Engineering (I was the co-advisor).

Fractional diffusion equations: exact solutions and anomalous diffusion (papers [13], [18], [21], [29], [37], [45], [56], [61], [63], [67], [69], [72], [73], [77], [81],-[85],[88], [90], [94], [96], [97], [100], [107], [110], and book [5]). The use of fractional calculus in applied contexts is a relatively

new line of investigation. Together with my young colleague, Ervin K. Lenzi, we started a detailed investigation of the exact solutions of fractional diffusion equations in several different geometries and in various dimensions, aiming at providing some help to understand real problems (or, at least, some simplified version of them). We focused our attention in describing those systems presenting anomalous diffusion. This permitted us to explore mathematical aspects of very different systems and mathematical difficulties (e.g., papers [67] and [90]), including the ones, which are common in chemistry and chemical engineering (reaction of solid surfaces, catalysis problems, sorption-desorption processes, etc.) (papers [21] and [29]). We have also investigated the potential usefulness of this kind of approach to describe the specific heat of non-crystalline solids (papers [72], [84], [96], [100], and [107]), fractional Schrödinger equation (papers [45] and [82]) as well as nonlinear fractional diffusion equation in one and three dimensions (papers [18], [37], [83], [94] and [97]). A series of mathematical problems in this regard have been collected and discussed in the book Fractional Diffusion Equations and Anomalous Diffusion, published recently by the Cambridge University Press (2018) ([5], in the list of publications below).

Fractional diffusion equations and Impedance Spectroscopy (papers [14], [17], [20], [33]., [34], [36], [42], [44], [48], [50], [52], [59], [75]). Impedance spectroscopy is a technique used to investigate electrical properties of liquid materials. The sample is submitted to an ac voltage of small amplitude to assure that its response to the external signal is linear. The role of the mobile ions is crucial in determining the measured values of the impedance. The diffusion of the mobile charges is taken into account by means of the Poisson-Nernst-Planck continuum model. In this model, the fundamental equations to be solved are the continuity equations for the positive and negative charge carriers coupled with the Poisson's equation of the electric potential across the sample. Starting from a preliminary work using only fractional time diffusion equation (with blocking electrodes condition) in paper [75], we proposed an increasingly sophisticated number of models to face the rich complexity of the phenomena dealing with the electrochemistry impedance. In our pioneering approach, the diffusion equation is rewritten in terms of fractional time derivatives. The model is reformulated with the introduction of the fractional equation of distributed order for the bulk system. As a step further, we proposed a new model – now called PNPA model (where "A" stands for Anomalous), which is built by extending the use of fractional derivatives to the boundary conditions, stated in terms of an integro-differential expression, governing the interfacial behavior. It is shown that the formulation based on the fractional diffusion equations establishes on general theoretical grounds a connection between the PNPA models with an entire framework of continuum models (paper [33]) and equivalent circuits with CPE (constant-phase elements) to analyse impedance data (paper [36]). As before, a series of mathematical problems in this regard have been collected and discussed in the two last chapters of the book Fractional Diffusion Equations and Anomalous Diffusion, published recently by the Cambridge University Press (2018) ([5], in the list of publications below).

1.3 Complete list of all the significant publications of the candidate, including those listed at points 1.1 and 1.2 (to be attached to the end of the Curriculum).

(See the attached file titled "References").

SCIENTIFIC PUBLICATIONS
(Summary)

- I have published more than 180 scientific papers from 1985 and 2018.
  A detailed list of publications may be found in http://lattes.cnpq.br/3821297511662902
- I have also attended several scientific meetings of importance in the area of complex fluids. Some of them are *l'International Liquid Crystals Conference* (since 1992), the *Gordon Conference on Liquid Crystals* (2009 and 2011), the *European Conference on Liquid Crystals* (since 1999)) and the *Topical Meeting on Optics of Liquid Crystals* (since 1997), *APS March Meetings* (2016, 2017, and 2018). In these meetings I have presented several oral communications and invited speaker talks.

I have published **five** scientific books as described below:

1 *An Elementary Course on the Continuum Theory for Nematic Liquid Crystals*, with Giovanni Barbero (World Scientific Publishing Co., London-Singapore, 2001);
http://www.worldscientific.com/worldscibooks/10.114 2/3557
ISBN: 981-02-3224-1

2 *Adsorption Phenomena and Anchoring Energy in Nematic Liquid Crystals*, with Giovanni Barbero (Taylor & Francis, London, 2006);
http://www.crcpress.com/product/isbn/978084933586

3 *Fractional Diffusion Equations and Anomalous Diffusion*, with Ervin K. Lenzi (Cambrdige University Press, Cambridge, 2018);
https://doi.org/10.1017/9781316534649

4 *Perspectivas em História da Física–Volume1–Dos Babilônios à Síntese Newtoniana*, Luiz Roberto Evangelista (Livraria Ciência Moderna, Rio de Janeiro, 2011). (In Portuguese)
http://www.lcm.com.br/site/#livros/detalhesLi vro/perspectivas-em- historia-da-fisica—volume-1---dos-babilonios-a-sintese- newtoniana.html
ISBN: 978-85-399-0169-2

5 *Perspectivas em História da Física – Volume II – Da Física dos Gases à Mecânica Estatística*, Luiz Roberto Evangelista (Livraria da Física, São Paulo, 2014). (In Portuguese).
□□□□□□□□□□□□https://www.livrariadafisica.com.br/detalhe_p roduto.aspx?id=143318
ISBN: 978-85-7861-291-7

I have published **two** books dedicated to the scientific divulgation as described below:

1) *Il Big-Bang e la Teologia – Una Contesa* – Luiz Roberto Evangelista (Classi Editori, Paris-Florence, 2016), p. 112. Originally written in Italian.

2) *Adagio Sostenuto – Sui sentieri del tempo, dalla Magna Grecia al Cern* – Luiz Roberto Evangelista (Classi, Paris-Florence, 2017), p. 285. Originally written in Italian.

The same book has been also published as a trilogy:

i. L. R. Evangelista, *Tempora sunt tria I – Percezione*, (Classi, Paris-Firenze, 2017) pp. 142. Originally written in Italian.

ii. L. R. Evangelista, *Tempora sunt tria II* – Memoria, (Classi, Paris-Firenze, 2017), pp. 103. Originally written in Italian.

iii. L. R. Evangelista, *Tempora sunt tria III – Aspettativa*, (Classi, Paris-Florence,2017), pp. 86. Originally written in Italian.

SCIENTIFIC COLLABORATIONS
(Overview)

In the period December 89 – December 1990, I had a post- doctoral position at the old Dipartimento di Fisica del Politenico, in collaboration with Prof. Mario Rasetti and Prof. Carla Buzano in the field of statistical mechanics, and with Prof. Giovanni Barbero, working on problems in the field of liquid-crystalline systems. The collaboration with Prof. Barbero is still working and produced until now more than 50 scientific papers on mathematical physics of liquid crystals and two scientific books.

In the years 1992, 1993, 1994 I worked as P*rofessore a Contratto* (about one month each year) at Dipartimento di Fisica del Politecnico di Torino, lecturing the advanced course *Metodi di Campo Medio in Meccanica Statistica*, with applications to magnetism, liquid crystals and superconductors.

In 2010, (September-October) I was visiting professor at Università della Calabria (Arcavacata di Rende). I gave a set of lectures on physics of liquid crystals to the students of the (International) Doctoral Program of that institution.

In the period since the first stay in 1989 until now, I have visited Italy frequently and I have established collaborations with other researchers in Politecnico di Torino (Turin), INFN and Dipartimento di Chimica Industriale (Bologna), Università della Calabria, among others.

I have organised, together with Paolo Pasini, Antonio d'Alessandro (Roma), Cesare Chiccoli e Claudio Zannoni, the *I Italian-Brazilian Workshop on Liquid Crystals*, Erice 2012. The same group has organised also the *II Italian-Brazilian Workshop on Liquid Crystals*, in Maceió, Alagoas, Brazil, in 2013, and the *III Italian-Brazilian Workshop on Liquid Crystals*, at Portonovo , June 2016.

Together with Jonathan Selinger (Kent State University), we have organized the Workshop *Geometry of Soft Matter*, in the International Institute of Physics, Natal, Brazil (May 19—25, 2018).

I have collaborations in USA with Prof. James Ross Macdonald, Department of Physics and Astronomy, University of North Carolina at Chapel Hill, and Professor Quan Li (Liquid Crystal Institute, Kent State University).

I had scientific collaborations with several other researches in India, Greece, France, Sweden, Russia, Romania, and Bulgaria.

OTHER SCIENTIFIC AND ACADEMIC ACTIVITIES

- I have organised several international scientific meetings besides the already mentioned Italian-Brazilian;
- Since 1997, I have been the Supervisor of several theses of Master of Science and Ph. D. degrees, in the PFI – Doctoral's Program of Universidade Estadual de Maringá;
- I am member of the steering committee of National Institute of Complex Fluids – a Institute that join more than 50 scientists in Brazil (physicists, mathematicians, biologists, chemists, and medical doctors) – Brazilian Agency CNPq and FAPESP – São Paulo Foundation.

AWARDS

- I have been reviewer for prestigious scientific publications like Physical Review Letters, Physical Review E, European Physics Letters, Liquid Crystals, Journal of Chemical Physics, Journal of Physical Chemistry, Langmuir, Applied Physics Letters, Journal of Applied Physics, Physics Letters A, Molecular Crystals and Liquid Crystals, and many others.

Special Awards

- I received the (Prize) **Premio Internazionale Giornalistico e Letterario Marzani, from Associazione Campania Europa Mediterraneo**, San Giorgio del Sannio (BN), Italy, on September 10, 1017 for the work done with scientific divulgation, in particular for the books (in Italian) mentioned above;
- I received the (Prize) **Premio San Giorgio**, from Centro Studi Molisano, for the distinguished career as Professor and Scientist (Campobasso, 2015);

- I received the **Honoured Citizenship Award** from Toro (CB), on May 28, 2015;
- I was pointed as **Outstanding Referee** for the journals of American Physical Society, in 2014;
- I received the **Honored Citizenship Award** from Maringá, Paraná, Brazil, in 2010, for excellence in Science and Education.
- I was elected as **Patron of Undergraduate Students of Physics** in several (about 10) occasions in the last 37 years;
- I was elected as **Patron of all Undergraduate Students** of Universidade Estadual de Maringá in 2011.

2. Teaching activity

- I have been **teaching** in Departamento de Física, Universidade Estadual de Maringá, since 1982 (more than 36 years). I have been responsible for the undergraduate courses of Statistical Mechanics, Classical Mechanics, Quantum Mechanics, Modern Physics, Mathematical Methods of Physics, and History of Physics (among others, as basic physics for Engineering). In the Graduate Program (Ph. D. and M. Sc.), I have been responsible for the disciplines of Quantum Mechanics I (since 1997) and II (since 2000) and Statistical Mechanics (since 1997). These are regular courses of one-semester each one.

- I was the **supervisor** of the following students:

  - **1** post-doc
  - **12** Ph. D. thesis (4 years each one): (see http://www.pfi.uem.br/producoes/teses/)
  - **16** Master of Science Thesis (2 years): (see http://www.pfi.uem.br/producoes/dissertacoes/)
  - **17** Laurea(monograph):
  - **18** Scientific Iniation (with a fellowship, undergraduate): 18

3. Institutional offices and roles in Italian and foreign Universities and/or public and private institutions with scientific and/or technology transfer aims

- I was the **Director** (Preside di Facoltà) of the Exact Sciences Center (Facoltà di Scienze Esatte) of Universidade Estadual de Maringá – 4 years (May 1996- to May 2000) joining the Departments of Statistics, Chemistry, Physics and Mathematics;
- I was the **Coordinator** of the Doctoral Program of Physics Department (PFI – Pós Graduação em Física) for two years (July 2006 – July 2008);
- I was member of the Universitary Council (Senato Accademico) for two years: July 2009—July 2011) representing the Physics Department.

- I was the **Associate Editor** for the area of Condensed Matter Physics of the **Brazilian Journal of Physics**, edited by Springer-Verlag, during the year Feb 2014 - March 2015.

- I am member of the **Editorial Board of Nature Publishing Group**, working as for Scientific Reports (since January, 2015).
- I am member of the **Editorial Board of Physical Review E** (American Physical Society) since January, 2016.

Place and date _Maringá, PR, 09/27/2018