



MAURO FERRARI (talking about doctoral life with ...)

by Enrico De Angelis

Months ago, Politecnico hosted a special guest, Mauro Ferrari.

Invited by his friends in DICA Department he gave a perky, public, long open speech about research trends and his experience: his story as researcher (but also musician, runner, father and husband, ...) and his role as future President of the *European Research Council*.

(I suppose you already know very well what ERC is but if not, start from its [Starting Grants!](#))

Weeks after, I had the privilege of a skype call with him: I wanted to collect some of his thoughts, hints and comments about how to improve PhD life. He was sitting in the living room of his Texan house, sipping coffee and relaxing after a first (very) early morning working time, and we had the chance to discuss many questions. The following lines reaggregate our talk in four main Q-points (and M.F. answers).

▪ **Q1 about MULTIDISCIPLINARITY**

The character of today's most innovative research projects is multidisciplinary, something opposed to traditional PhD disciplinary paths: **WHICH WAY AN EARLY STAGE RESEARCHER SHOULD CHOOSE?**

M.F.: We must consider two things: the first is that what we call Disciplines have a historical and social meaning. It took hundreds of years to establish their role, since medieval times, and, although they may seem immutable, they are dynamical entities: they change. In science, there is a complex equilibrium between conservative and innovative forces. And innovation, in research, usually happens in the intersections between two or more traditional disciplines, while a PhD Thesis may be the best chance to activate such a start.

But it depends (and this is the second point) on the PhD Candidate's attitude.

About this second point, a hint to Polimi Students: your choice must be done soon. Are you happy with the uncertainties of new paths in the unexplored lands of science? Do you really feel the need of being creative? If so, and if you are really brave, try it. On the contrary, if you prefer a more comfortable, easier life, choose the beaten track to reach the top of the mountain. In both cases, you must start running. A PhD is something like a Marathon.

And a hint to Polimi professors: facilitate the choice for innovative paths: Italy is a creative nation and Italian creativity is a strategic advantage also in the research sector.

And organize "protected areas" where new paths may be "cultivated".

And help Candidates to be aware of their attitudes and to choose their path.

The optimal ratio? I'd say 30% innovation.

<the interview continues in the last page>

Mauro Ferrari life as scientist may be synthetized in the following steps: degree in Mathematics in Padua, Master and PhD in Berkeley, in Mechanical Engineering, he started as researcher in his born town, Udine. He quickly moved back to [Berkeley](#) (links are example quotations) as assistant and associate professor and worked for the first part of his life on (new) materials, their mechanical properties and their application in Civil Engineering. Then the decision to devote himself to the global battle against cancer, applying Mechanical Engineering to Medicine: first, in [Berkeley](#), then at [Ohio State University](#) (as director of the Department of Biomedical Engineering), then as leading pioneer of Nanomedicine at the [University of Texas](#) (director of the Department), eventually as President and CEO of the [Methodist Hospital Research Institute](#) in Houston, one of the world leader institution in the field. He recently retired to become the next ERC President (he will take this office next January, watch [here](#) his acceptance speech).

He is a special, clever, empathic, hard worker who reminded me another chief scientist, such Newton Isaac, saying «If others would think as hard as I did, then they would get similar results».

Refer to his [Wikipedia page](#) and his [Author Detail page](#) for more info.





CALLS AND EVENTS



POLITECNICO
MILANO 1863

SCIENZA E FILOSOFIA

Series of seminars in memory of Adriano Morando

The separation and incommunicability between science and philosophy is relatively recent. Even in times close to us, there was no shortage of scientists who dealt directly with philosophical problems (mainly epistemological, but not only) or philosophers who dealt with scientific issues in a quite competent way. There are several reasons that caused the gap to widen, but this situation should not prevent us from seeing how, on one hand, the scientist, consciously or not, is conditioned, sometimes positively, sometimes negatively, by theoretical choices (meta-physical?) and "conceptions of the world", without which in reality science could not progress. On the other hand, if philosophy does not want to end up in an empty self-referential discussion, it should consider also specific knowledge, first of all sciences.

Starting from this reflection, focused on the dialogue between scientists and philosophers, we will commemorate the figure of Adriano Morando and his commitment to this cross fertilization.

This year's topic will be "Our history".

Participation is free, but registration is required to the following [link](#)

September 19, 2019



ASSOCIAZIONE
Altero Matteoli
per la Libertà e il Bene Comune

ALTERO MATTEOLI SCHOLARSHIPS

"Associazione Altero Matteoli per la Libertà ed il Bene Comune" promotes scholarships in the field of environment, transport and infrastructure (including logistics).

To submit an application follow the instructions contained in [this link](#)

Application deadline: 25 January 2020



OFFICINA*

OFFICINA* CALL FOR ABSTRACTS

OFFICINA* is a cultural association, founded by three PhD holders from IUAV, aiming at networking academic research with professionals and companies in the field of architecture, design and building technology. OFFICINA* is selecting ideas and contributions for the 4 issues of its magazine for 2020. The participation in the OFFICINA* editorial project is open to teachers, researchers, postdocs, PhD students, students and professionals, both Italians and foreigners. To participate at the call for abstract you can send your proposal as an abstract of 1,500 characters, in Italian or English. The proposal must be sent to officina.rivista@gmail.com, using the format provided in [this webpage](#). The abstract must clearly show relevance to the theme of the call. Each author can send a maximum of two abstract proposals.

Application deadline: September 5, 2019





2019 NII INTERNATIONAL INTERNSHIP PROGRAM

The NII - National Institute of Informatics of Japan is pleased to announce the launch of the 2019 NII International Internship Program.

For developing better research contacts with partner institutions whom NII has signed MOU agreements (Memorandum of Understanding) with, it has been decided to promote the possibility of receiving Master's and/or Ph. D. degree students from these institutions as interns.

Application deadline is on October 23rd, 2019 (at 5.00 pm Japan time).

Further information about the applications is available [here](#).

Deadline for applications: 23rd October 2019



OPENHACK MICROSOFT/LHCB/CERN

The Staff of the LHCb experiment at CERN, and Microsoft, are looking for PhD candidates in Physics, Computer Science and Data Science to participate to the 3-days OpenHack event that will be held on 11-13 September 2019 at the Bruno Kessler Foundation (in Trento), research institute affiliated to CERN, to analyse real LHCb data by using Microsoft AI. The PhD candidates will work directly with LHCb Physicists and Microsoft Cloud Advocates to perform the following analysis:

- Data exploration and visualization
- Classification and anomaly detection
- Source control and automation
- AML experimentation
- AML for hyperparameter tuning
- Real-world application of data

There is no registration fee. Participants will have cover their travel and lodging expenses. During the event coffee breaks and lunches will be offered, as well as a social dinner. Interested candidates are requested to fill in and submit the following [registration form](#) as soon as possible and will receive some preparatory material to be read before the event. For any further information contact monicar@microsoft.com

11-13 September 2019



SEMINARS AND WORKSHOPS



IMPLEMENTATION OF NANOPARTICLES IN MULTIMODAL MEDICAL IMAGING

Prof. Haim Azhari, Technion - Israel Institute of Technology

This lecture will focus on the use of nanomaterials in medicine. The mechanisms responsible for contrast generation in Ultrasound, MRI, and CT will be reviewed; then, the motivation for multimodal imaging will be explained and a detailed description of several projects implementing nanoparticles-based materials will be described.

September 9th, 2:00 pm – Sala Consiglio, Dept. of Mechanical Engin., Via La Masa 1





STARTING COURSES – DOCTORAL PROGRAMMES

PHD IN INFORMATION TECHNOLOGY

DATA-DRIVEN APPROACHES TO UNCERTAIN OPTIMIZATION: THEORY AND APPLICATIONS

Prof. Simone Garatti

The aim of this course is to introduce the student to data-driven approaches for optimization involving uncertainty and to show that they offer a viable solution methodology in a variety of problems.

From 2nd to 6th September 2019



STOCHASTIC PROGRAMMING

Prof. Michel Gendreau

The course will provide a general introduction to the foundations of stochastic programming and describe some of its typical applications areas. It will cover, among other things, basic modelling issues, mathematical properties, and some standard as well as advanced algorithms.

From 30th September to 11th October 2019





TALKING ABOUT DOCTORAL LIFE with MAURO FERRARI <from the first page>

■ Q2 about SOFT AND TRANSERRABLE SKILLS

Our PhD School, definitively adopted this model and offers a long list of transferrable skills courses, to improve PhD Candidates capacities: **IS THIS THE RIGHT WAY?**

M.F.: Well, I am an extremist in this: for example, I practiced, and I oblige my researchers to practice, Actor Studio workshops! What may seem negligible, is, instead, something fundamental: your Students are going to become leaders, not just laboratory staff: the world has changed, and it requires researchers to be able to explain and also to manage and to team up a group.

Politecnico, its PhD programs in particular, are training future leaders and these leaders must be able to explain their ideas, projects and reasons. Not only: they must also be aware of what they have inside, if they want to enter in a stronger relation with those ... outside.

At least, this is my personal experience: the world is going "softer": I am sure I have been chosen to chair ERC not only because of my publications and my awards. Your proficiency in science is just a pre-requisite for a top-manager in science: you choose who, among the best scientists, have the highest attitude for a TV talk and to explain projects to Ministers and Parliament Members, as well as to common men and women. And I was able to refine my communication skills when I had the chance to practice the stage as an actor and as a guitar player.

Hard skills are fundamental, but technologies, methodologies and solutions, they are all going to be obsolete in few years. While the softer are longer lasting.

■ Q3 about ETHICS

We recently met Effy Vayena, Chair of Bioethics at ETH Zürich, who told us that today, the life of an expert asks for a constant ethical tension, in particular for the pace and the scale of technological changes. **IS ETHICS A CARDINAL POINT FOR THE FUTURE RESEARCHERS?**

M.F.: Using an expression from Physics, Ethics is the field equation, anything else is just a corollary. Sooner or later, your work will evolve toward ethical questions. And the more important it is, the quicker it will happen and the bigger the questions.

It is often difficult to find answers to big questions, but there are some basic universal concepts on which everyone may agree. In medicine, for example, is the help for the life of others.

In any case, PhD should be trained to face big questions, not only about self-plagiarism.

■ Q4 about RECRUITING

In Italy, selection processes are often criticized: **WHAT CAN WE LEARN FROM THE BEST RECRUITING PRACTICE AROUND US?**

M.F.: As principal investigator and Head of Department, I hired more than two thousand people. How to choose? Mistakes will always happen, so don't despair. But learn from errors and always try to balance: a dynamic equilibrium is the best choice. I mean a balance between different people chosen among the best, most motivated ones: diversity not uniformity! A uniform group of people may win, in the short time, but in the medium and long time, you will have only clones of yourself. Diversity is not matter of social justice only: if you want to be a great institution, you need the magic powder of creativity. And it cannot come from your clones: uniformity kills creativity.

I will never accept a team without women, Afro-Americans, Latinos ... but it is not only a question of gender or color or sex attitude. The spark of new ideas is as important as self-esteem, mutual trust and team spirit and these factors may arise from graduates and students who excelled in something else than grades.



European Research Council
Established by the European Commission

Let us point out what European Research Council is (also if you probably already know!): it funds basic research and it might fund you at any stage of your academic career (after your PhD degree). So, start browsing its [website](#) now!!

Also take note that our Research Office may not only provide you information about ERC calls: its helpDesk is happy to support you to design your research ideas, to draft your research project and to apply for a grant.

In any case, our Research Office is here to support you in your career development, (starting from your CV writing) and to accompany you in your path, as early stage researchers, also through training and targeted activities.

Contact: ricerca@polimi.it

TRAINING THE mindSET

Improving and Internationalizing Skills Trainings for Doctoral Candidates

Co-funded by the
Erasmus+ Programme
of the European Union



August 2019

Dear Readers,

Welcome to our newsletter for the Erasmus+ project "Training the mindSET".

Since October 2018, Technische Universität Berlin (TUB) and its consortial partners, Norwegian University of Science and Technology, Politecnico di Milano and Warsaw University of Technology, have formed a strong collaboration to develop a European Core Curriculum in Transferable Skills for PhD candidates in Science, Engineering and Technology (SET) disciplines and training material for the respective modules. The curriculum will be implemented and tested in joint workshops with participants and trainers from each university.

Please visit mindSET's website for further information, news and resources: <http://www.mindset-project.eu/>. During the course of the project, all results will be provided as free downloads, so please stay tuned!

If you have any questions regarding the project, please reach out to us: <http://www.mindset-project.eu/partners/>.

We look forward to staying in touch!

Petra Nikol
Centre for Scientific Continuing
Education and Cooperation (ZEWK)
Project Coordinator



Dear Readers,

We at the TU Berlin Department of International Affairs are excited about the possibilities mindSET offers to intensify the cooperation between TU Berlin and its three strategic partners.

The joint development of a European core curriculum in transferable skills is strengthening the partners' understanding of the structures and framework conditions of doctoral training. The joint courses offer doctoral students the opportunity of international and interdisciplinary networking and the chance to make targeted contact with researchers at the host university. Thus, mindSET contributes to the internationalisation of the training of young scientists at the participating partner universities. The network partners T.I.M.E.-Association and CESAER support the dissemination of the curriculum and the instruments at other universities, making a sustainable contribution to the Europeanisation of doctoral training.

Grietje Zimmermann
Head of Section
International Projects

TRAINING THE mindSET

First Project Results online

Free download of mindSET's analysis report of the European Transferable Skills Training Demands Survey under the following link:

<http://www.mindset-project.eu/results/curriculum/>



mindSET's latest results will be presented at the joint assembly of T.I.M.E. and CESAER in Paris (16-18 October 2019): <https://www.cesaer.org/events/cesaer-annual-meetings-2019/>

<https://timeassociation.org/2019/08/19/the-t-i-m-e-general-assembly-2019->

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