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**UNIVERSITÀ  
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ASTROFISICA**



**GRUPPO ITALIANO  
RICERCATORI  
PATTERN RECOGNITION**

The Workshop is addressed to researchers and Ph.D. students in *Physics, Biology, Mathematics* and *Computer Science*. It will be held at the “Ettore Majorana Foundation and Centre for Scientific Culture”, Erice, Trapani, Italy.

The “Data Analysis in Astronomy” Workshop series started in 1984 aiming to provide an updated overview of advanced methods and related applications to Astronomy and Astrophysics; the workshops constitute the first in time forums where astrophysicists and computer scientists could discuss, debate and compare results and methods, theory and experiments. The series progressively enlarged its scope toward simulation and modelling, opening also, in the 2007’s edition, to further major branches of Science as Biology, Bioinformatics, Climatology and Earth Physics; the success of that year gave also birth, thanks to Vito Di Gesù, to the International Consortium for Interdisciplinary Science, ICIS, which strongly contributes to the present edition.

Simulation, modelling and interdisciplinary-science together highlight the key role of system representations. Consistent with new emerging theories and technologies, the present edition will be devoted to the representation problem. It is admitted that representations are necessary for humans to understanding phenomena and they may help elaborating theories. They are likely key features of the leaving, where programs of systems are transmitted. Images to represent system behaviours for their understanding prove representations as information supports. That in turns introduces the importance of noise, also latent in biological growth, and sends back to the compressing role of representations. Eventually, the technological burst of “informatics” images spreads them at every stage of any current scientific steps. So that a problem to solve in parallel with most other scientific studies turns out to be “how to master the huge amount of data generated by the least observation”.

The 2011’s workshop, subtitled “**SCIENCE: IMAGE IN ACTION**”, aims at studying and discussing instances of the representation problem in Physics and Biology, with emphasis on Astronomy, Cosmology, Earth environment and climate studies.

Speaking of imaging and abstraction, we will endeavour to stress links between the various topics considered in these areas. Unifying theories and trans-discipline tools should illustrate the character of universality of pertaining representations. On the other hand, the emergence of artificial agents, synthetic images, data miners and other computed facilities to help abstraction handling will be discussed both in its genuine aspects and through examples at various levels.

The program will be arranged in single sessions with invited and contributed talks. Main topics will be addressed, but not limited, to:

- inference mechanisms in modelling: from Bayes to self-assembly and perhaps more;
- data merging: mastering uncertainty, imprecision and incompleteness;
- perceptual models: scale invariance, quantum physics and geometry, etc.;
- credible agents: reality, models and (computer) representation of complex systems;
- multi scale analysis: rare phenomena, data mining and large data bases;
- virtual and augmented reality to experiment: from computer graphics to virtual observation or computational biology;

*On the behalf of Prof. A. Zichichi (President of the EMFCSC),  
the “DAA - Data Analysis in Astronomy” Workshops are from now dedicated to  
“Livio Scarsi and Vito Di Gesù” who were the enthusiastic inspirers of the series.*

**Submission:** There is room left for 20 submitted papers on all topics that fit the scope of the workshop, whether they are theoretical or they deal with experiments and results. Papers, 3 to 8 pages drafts + illustrations if any, will be reviewed by committee members and expert guests.

Submission deadline: **January 31<sup>th</sup>, 2011**  
 Notification of acceptance: **February 28<sup>th</sup>, 2011**  
 Final version to be sent: **March 15<sup>st</sup>**  
 Conference: **April 15<sup>th</sup>, 2011**

together with registration fees, to appear in the proceedings

**Fees:** Registration fees are 800€ (400€ for accompanying persons). Unless otherwise specified, they cover all accommodation for the duration of the workshop, one sample of the proceedings, registration to the conferences, to the gala dinner, and to the excursion day.

**Student/Young researcher Grants:** Subjected to the appreciation of the Workshop Committee, 5 to 10 deserving students, depending on the level of the submitted papers and CV, will be exempted from paying registration and accommodation. This is allowed by grants from the EMFCSC and the Paris XI University. Moreover, the GIRPR (Italian Chapter of IAPR) offers a scholarship of 500€ to the best young researcher presenting a paper to the workshop.

**Contact with the workshop**

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