



<http://cointoolbox.github.io/>

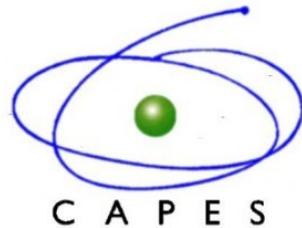
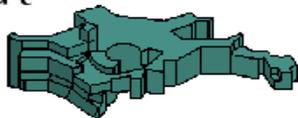
COIN

Methodology and Software for Cosmology

Emille Ishida
MPA – Germany

Python in Astronomy – Leiden, April 2015

Max-Planck-Institut
für Astrophysik



COIN

Methodology and Software for Co

High-end education

Astronomy

Emille Ishida
MPA - Germany



Mission:

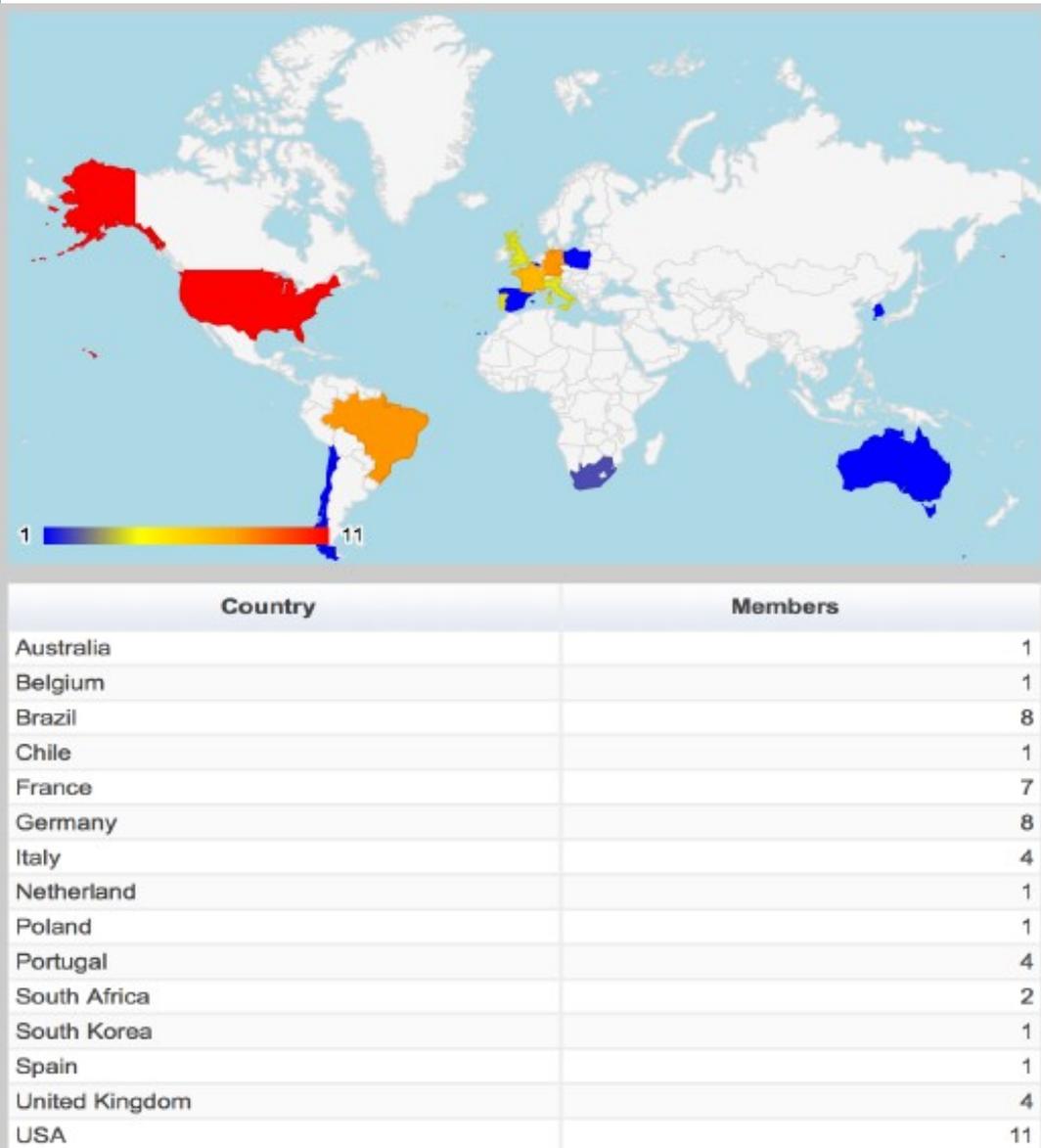
The Cosmostatistics Initiative (COIN), an international working group built under the umbrella of the International Astrostatistics Association (IAA), aims to create an interdisciplinary environment where collaborations between astronomers, statisticians and machine learning experts can flourish.

Meet COIN

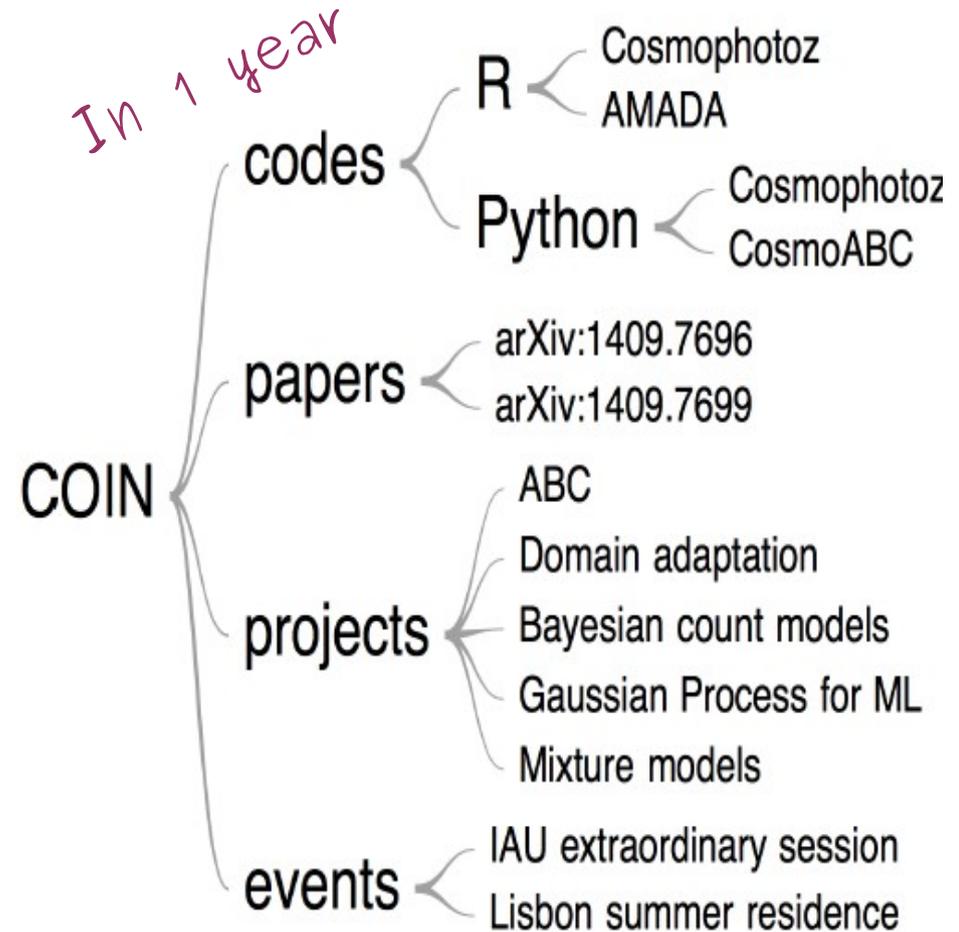
Lead by Rafael de Souza (ELTE, Hungary)

50 researchers from **15** countries

Nearly half actively involved in an ongoing project



Scientific outcomes



Long term goal:

Establish Astrostatistics as a discipline on its own.

Short term goal:

Make astronomers, statisticians, computer scientists and machine learning experts understand each other ...
WHILE doing science.....



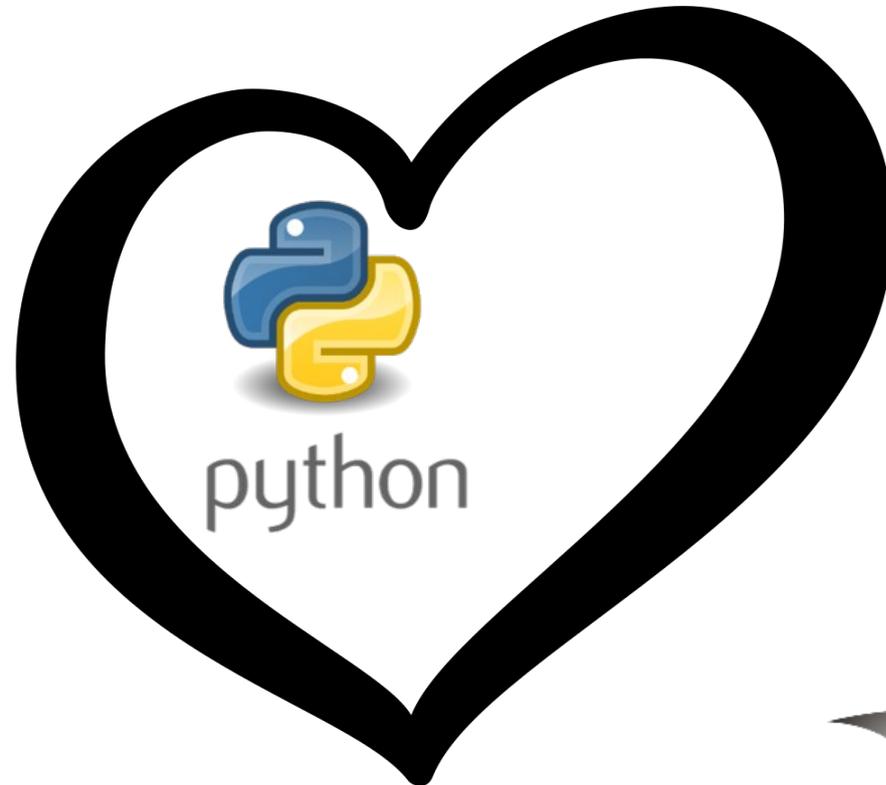
Cosmostatistics Initiative



Statisticians
love R...



... as we love Python



COIN tries to be bilingual
as much as possible

Cosmostatistics Initiative

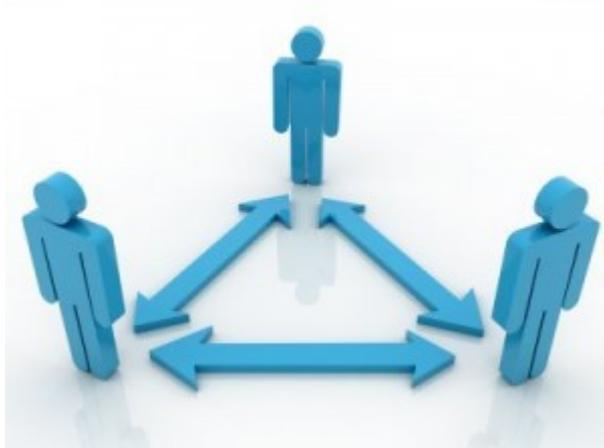


How we work



We recognize people with skills which might be used to solve a scientific problem, and propose it.

A COIN member come to us, describe the problem and we look at the pool of people which might be interested in the project.



The first COIN Summer Residence Program

August/2014, Lisbon



Cosmostatistics Initiative



The first COIN Summer Residence Program

August/2014, Lisbon

The Overlooked Potential of Generalized Linear Models in Astronomy - I: Binomial Regression and Numerical Simulations

R S. de Souza^a, E. Cameron^b, M. Killedar^c, J. Hilbe^{d,e}, R. Vilalta^f, U. Maio^{g,h}, V. Biffiⁱ, B. Ciardi^j, J. D.
Riggs^k, for the COIN collaboration

arXiv:1409.7696v1

The Overlooked Potential of Generalized Linear Models in Astronomy-II: Gamma regression and photometric redshifts

J. Elliott^a, R. S. de Souza^b, A. Krone-Martins^c, E. Cameron^d, E. E. O. Ishida^e, J. Hilbe^{f,g}, for the COIN
collaboration

arXiv:1409.7699v1

cosmoabc: Likelihood-free inference via Population Monte Carlo Approximate Bayesian Computation

<http://arxiv.org/abs/1504.06129>

E. E. O. Ishida¹, S. D. P. Vitenti², M. Penna-Lima^{3,4}, J. Cisewski⁵, R. S. de Souza⁶, A. M. M. Trindade^{7,8}
E. Cameron⁹ and V. C. Busti¹⁰ for the COIN collaboration

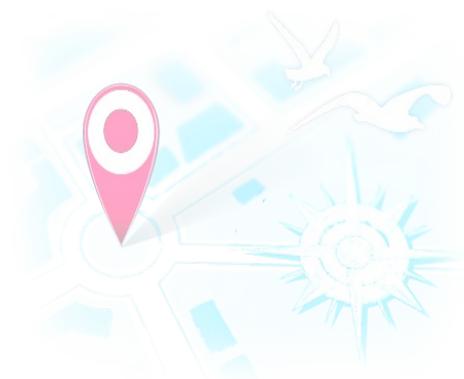
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The second COIN Summer Residence Program

Sometime in the second semester of 2015, somewhere in the UK



Cosmostatistics Initiative



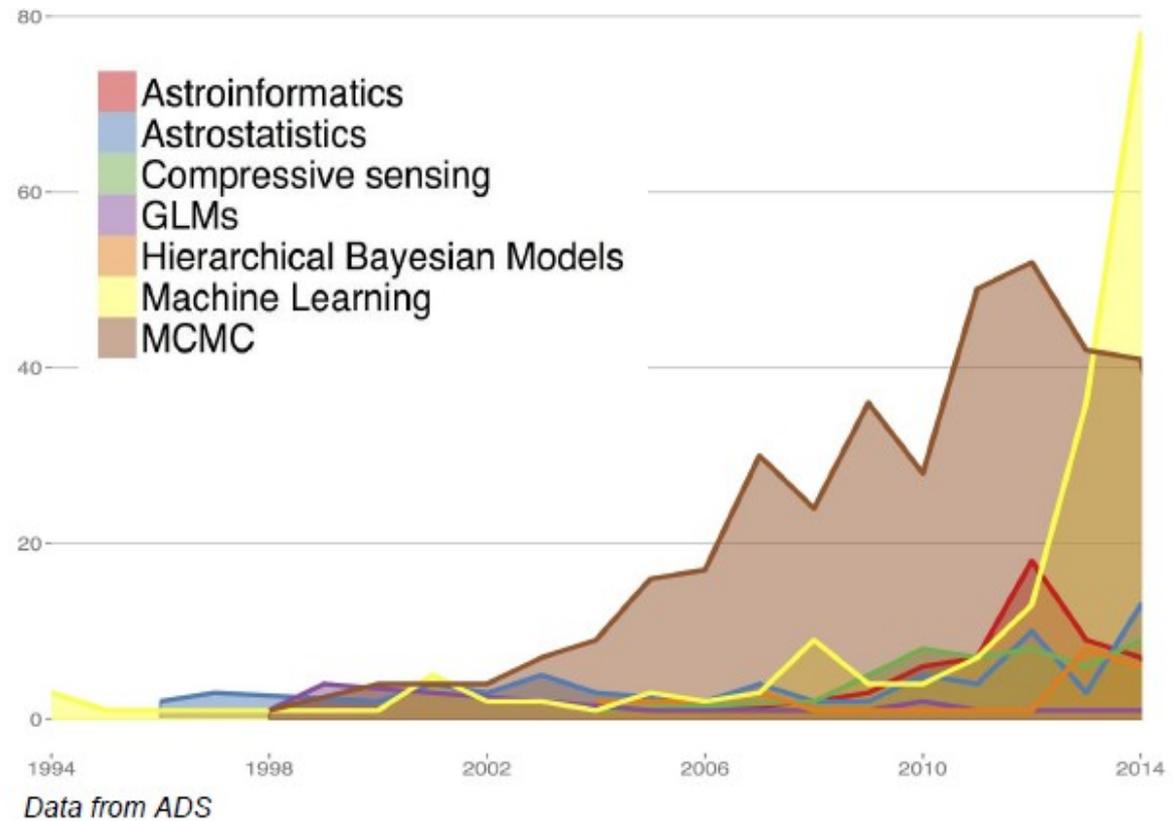
What's next?

November 04, 2014

The rise of astrostatistics

Astrophysicists and cosmologists are turning to statisticians to help them analyze an ever-increasing deluge of data.

By Lori Ann White



Significance, Dec/2014

astrostatistics

Making sense of massive unknowns

Astronomy data sets are astronomically big – that is why statistical approaches are needed to analyse, organise and unravel the mysteries of the universe. By **Rafael de Souza** and **Emille Ishida**

Cosmostatistics Initiative



Astronomy is still inspiring!





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