

# A Latin American graduate school – The PPGCosmo experience

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# The PPGCosmo PhD Program

## Motivations

- ▶ The *Programa de Pós-Graduação em Astrofísica, Cosmologia e Gravitação - PPGCosmo* was created in august 2016.
- ▶ It was the first Physics PhD program that received from CAPES (Brazil) the initial evaluation 5 at the moment of its creation, in a scale from 0 to 7.
- ▶ It is a *thematic* PhD program involving many institutions in Brazil and abroad.

# The PPGCosmo PhD Program

## Motivations

- ▶ The main motivations for the creation of this PhD program were the following.
  1. Physics and Astronomy are constantly demanding for larger collaborative networks using scientists from different countries.
  2. To provide an environment for PhD students where they could both have access and participate on high level theoretical research and large observational/experimental projects.

# The PPGCosmo PhD Program

## Structure

- ▶ Thematic areas include:
  1. Astronomy and Astrophysics,
  2. Astroparticle Physics,
  3. Cosmology,
  4. Dark Energy,
  5. Dark Matter,
  6. Gravitational Waves,
  7. High Energy Theory.

# The PPGCosmo PhD Program

## Structure

- ▶ The PPGCosmo is based at UFES, Espírito Santo, Brazil.
- ▶ It counts with the participation of the following Brazilian institutions.
  1. Centro Brasileiro de Pesquisas Físicas - CBPF/Rio de Janeiro.
  2. Universidade Federal de Juiz de Fora - UFJF/Minas Gerais.
  3. Universidade Federal da Bahia - UFBA/Bahia.
  4. Universidade Federal de Ouro Preto - UFOP/Minas Gerais.
  5. Universidade Federal do Rio Grande do Norte - UFRN/Rio Grande do Norte.

# The PPGCosmo PhD Program

UFES



# The PPGCosmo PhD Program

Vitória - ES



# The PPGCosmo PhD Program

## Faculty Members in Brazil

- ▶ Davi C. Rodrigues (UFES)
- ▶ Felipe T. Falciano (CBPF)
- ▶ Hermano Velten (UFOP)
- ▶ Humberto Belich (UFES)
- ▶ Ilya Shapiro (UFJF)
- ▶ Júlio C. Fabris (UFES)
- ▶ Marc Casals (CBPF)
- ▶ Martin Makler (CBPF)
- ▶ Nelson Pinto-Neto (CBPF)
- ▶ Oliver F. Piattella (UFES)
- ▶ Riccardo Sturani (IIP)
- ▶ Saulo Carneiro (UFBA)
- ▶ Valerio Marra (UFES)
- ▶ Wiliam Hipólito-Ricaldi (UFES)



# The PPGCosmo PhD Program

## Structure

- ▶ Abroad, we have the following associated researchers
  1. Alexey Starobinsky (Landau Institute, Russia) - Astrophysics, Cosmology, Gravitation.
  2. David Wands (University of Portsmouth, United Kingdom) - Astrophysics, Cosmology.
  3. Jorge Zanelli (CECS, Chile) - Gravitation.
  4. José A. de Freitas Pacheco (Observatoire de la Côte d'Azur, France) - Astrophysics, Cosmology.
  5. Luca Amendola (Universität Heidelberg, Germany) - Astrophysics, Cosmology.
  6. Ruth Durrer (Université de Genève, Switzerland) - Astrophysics, Cosmology.
  7. Scott Dodelson (Mellon University, USA) - Astrophysics, Cosmology.
  8. Yi-Fu Cai (USTC, China) - Cosmology, Gravitation.

# The PPGCosmo PhD Program

## Structure

- ▶ The student is followed by an advisor in Brazil and another abroad.
- ▶ The student must pass some time (typically one year) in the institution of the advisor abroad.
- ▶ The thesis must be connected with scientific cooperations among the different institutions.
- ▶ It is stressed the importance of a close connection between theory and observation/experiment.

# The PPGCosmo PhD Program

## Observational programs

- ▶ The PPGCosmo participates, at different levels, in the following observational programs.
  1. J-PAS.
  2. Euclid.
  3. DES.
  4. LIGO/Virgo.
- ▶ PPGCosmo promotes the following international conferences.
  1. Verão Quântico (Quantum summer),
  2. José Plínio Baptista School in Cosmology,
  3. Estate Quantistica (in Italy),
  4. Inverno Astrofísico (Astrophysical winter).

# A Latin America PhD Network?

## Considerations

- ▶ The activities in observational Astrophysics and Cosmology in Latin America have increased considerably mainly due to the construction of observatories in Chile, but also in Argentina.
- ▶ These observatories are among the best scientific facilities in the world at this moment.
- ▶ Even if the financial budget for their constructions came mainly from US and Europe, there is also an important effort of the Latin American countries.

# A Latin America PhD Network?

## Considerations

- ▶ However, the participation of many Latin American countries in these projects is below what could be expected.
- ▶ In this sense, a graduate program in Astrophysics and Cosmology, in the form of a network, may allow to propagate the formation of Latin American scientists in those domains.
- ▶ This graduate program may follow closely the PPGCosmo format, with the participation of universities and scientific institutions of different Latin American countries.
- ▶ The students of this program could have e.g. two co-advisors of different countries, increasing the scientific cooperation between the involved institutions.

# A Latin America PhD Network?

## Considerations

- ▶ The student formation could cover theoretical aspects of Astrophysics and Cosmology, but a preference would be given to observational/experimental formation, with the intensive use of the astronomical facilities installed in the Continent.

# A Latin America PhD Network?

## Considerations

- ▶ One important aspect, borrowing the PPGCosmo initiative, is that the formation of the student, even if done mainly at a given institution, must include a internship period in other institution belonging to the network, allowing the integration of the Latin American community working in Astrophysics and Cosmology.
- ▶ The use of the astronomical/experimental structures installed in the South of the Continent would be a priority in the PhD network program.

Obrigado!

