

Astronomia ao meio-dia, 9/nov/2017, IAG/USP

**Quero ser  
astrofísic@:**  
qualidades  
importantes  
para a carreira



A carreira de Astrofísica requer diversas qualidades, especialmente para quem quer fazer uma pós-graduação ou um pós-doutorado no exterior. Descreverei algumas qualidades importantes a desenvolver na graduação, pós-graduação ou pós-doutorado.

 @DrJorgeMelendez

Departamento de Astronomia, IAG/USP



# Quero ser astrofísic@!

Quando começar a  
planejar a carreira?

- Graduação?
- Mestrado?
- Doutorado?
- Pós-doutorado?



Como ser o(a) alun@ que tod@ professor(a) adoraria orientar para uma pós-graduação?

Ou como ser a pessoa que todo mundo adoraria contratar para um pós-doutorado em  
Astronomia?



# Warning! Você é idealista?

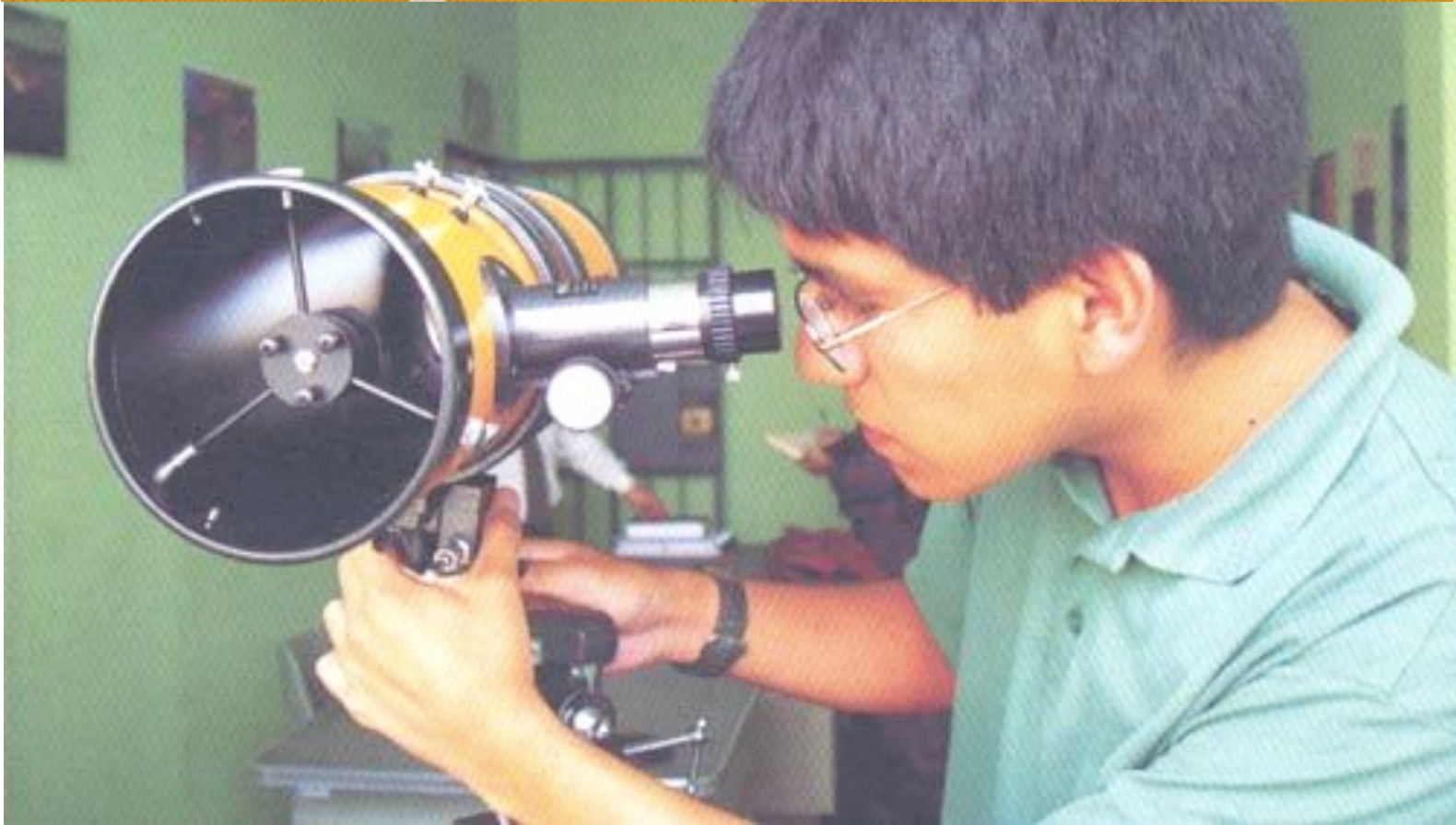
- Bolsas na graduação: 400 reais, 677 (FAPESP)
- Bolsa mestrado: 1500 (CAPES/CNPq), ~2000 (FAPESP)
- Bolsa doutorado: 2200 (CAPES/CNPq), 2930 a 3626 (FAPESP)
- Bolsa pós-doutor: 4100 (CAPES), 7175 (FAPESP)
- Professor na USP: começa R\$ 10671
- Dedicção exclusiva Univ. Fed. Goiás, R\$ 9570

# Quer fazer pós-graduação no exterior?

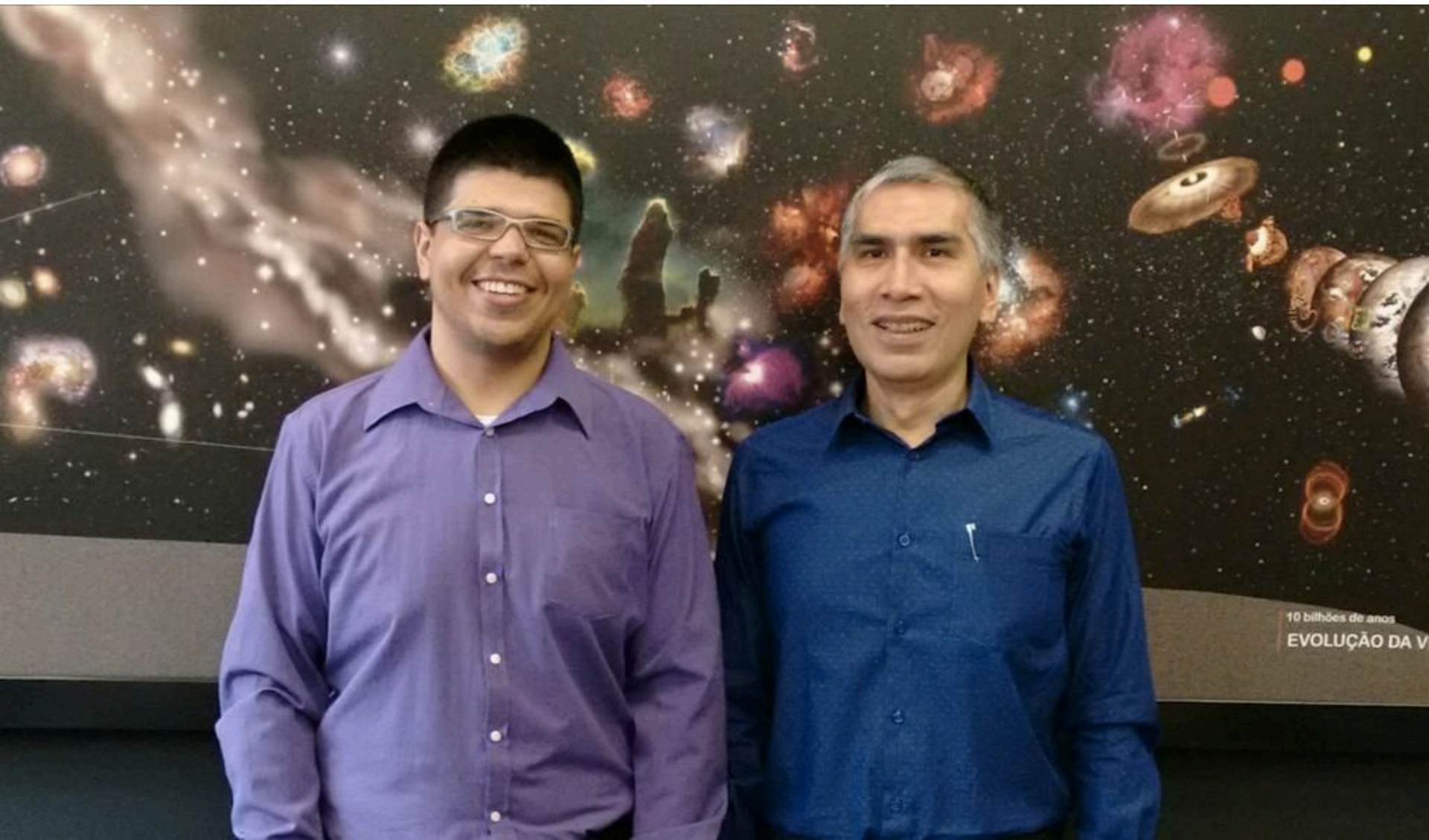
- Provavelmente vai precisar de 2 cartas de recomendação
- TOEFL
- Em algumas universidades americanas precisa do GRE (geral) e/ou GRE (física)



Iván  
Ramírez:  
Graduación  
no Perú,  
Pós nos  
EUA



# Léo dos Santos: mestrado no IAG/USP, doutorado na Europa (Geneva)



# Carta de recomendação, pode ser avaliação quantitativa e/ou carta

Not Applicable/ Unable To Respond	Below Average (lower 50%)	Average	Above Average (top 25%)	Outstanding	Truly Exceptional
N/A ou não sei responder	Abaixo média	Média	Acima média (top 25%)	Excelente (top 10%)	Excepcional (top 5%)

- Intellectual ability (intuition? problem solving?)
- Writing ability (boa redação)
- Speaking ability
- Academic preparation



Not Applicable/ Unable To Respond	Below Average (lower 50%)	Average	Above Average (top 25%)	Outstanding	Truly Exceptional
N/A ou não sei responder	Abaixo média	Média	Acima média (top 25%)	Excelente (top 10%)	Excepcional (top 5%)

- Research skills or potential (p.ex., python?)
  - Independence (precisa de pouca orientação?)
  - Motivation
  - Maturity/Responsibility (ability to finish projects)
  - **Teaching ability (USA)**
- Talvez na carta: Character or Personality?

# Como obter carta de recomendação

- Bom desempenho em alguma disciplina
- Iniciação Científica e/ou TCC (mesmo sem bolsa)
- Estágio de cultura ou extensão (divulgação)

Em qq caso sempre mostre **responsabilidade** (p.ex. chegar no horário, entregar trabalho no prazo) e **esforço** (dentro do possível).

Ponto fraco que está melhorando:

*A weak point of the student is writing, but (s)he is making important efforts to improve ...*

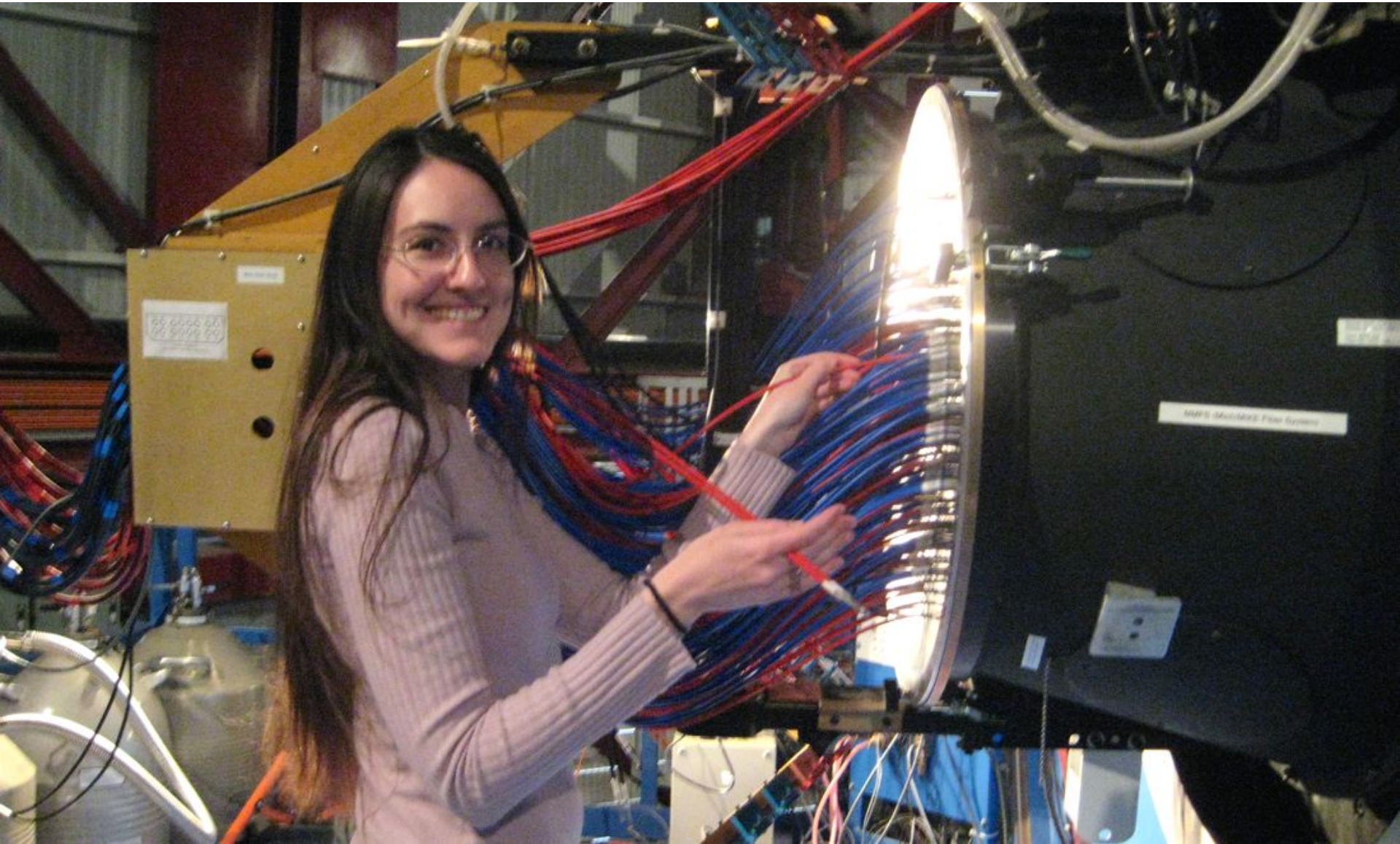
# Pleiteando pós-doutorado?

Vai precisar de 2 ou 3 cartas de recomendação

As melhores vagas são altamente competitivas

Qualidades adicionais às da pós-graduação

Tala Monroe, PhD Indiana, pósdoc IAG/USP,  
agora técnica no Instituto do Telescópio Hubble



Diego Lorenzo-Oliveira: ex-UFRJ, agora IAG/USP.  
Lorenzo Spina: ex-Florença, ex-IAG/USP, agora Monash





Carrara

<http://revistarochas.blogspot.com.br>

Michelangelo: *David*, 1501–1504.









A sua escolha  
pode fazer de  
você uma  
pessoa melhor



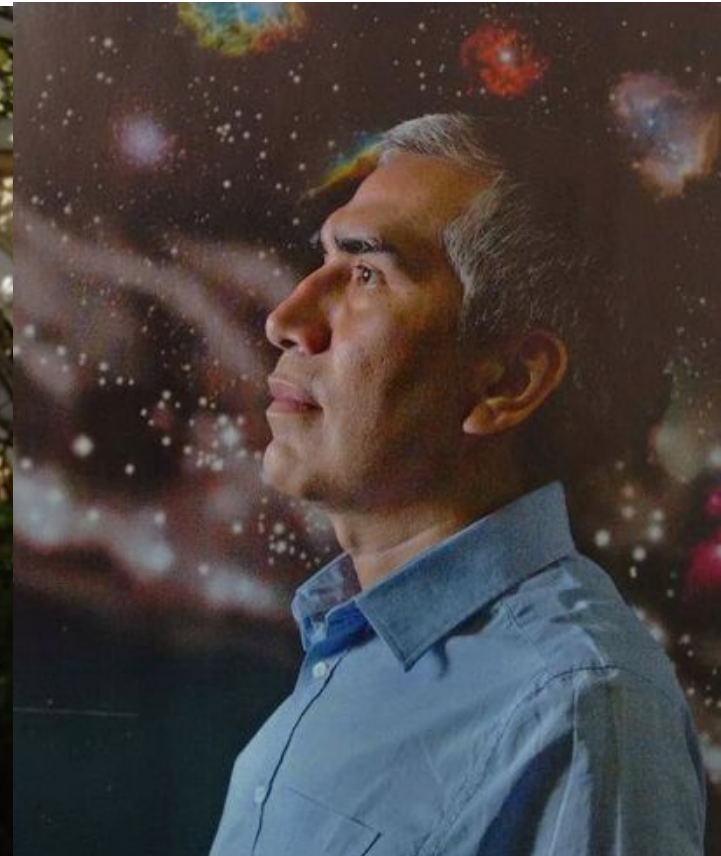


E todo mundo diz  
que ele completa  
ela e vice-versa,  
que nem feijão  
com arroz

# Complementaridade



Martin Asplund,  
supervisor do  
segundo pósdoc

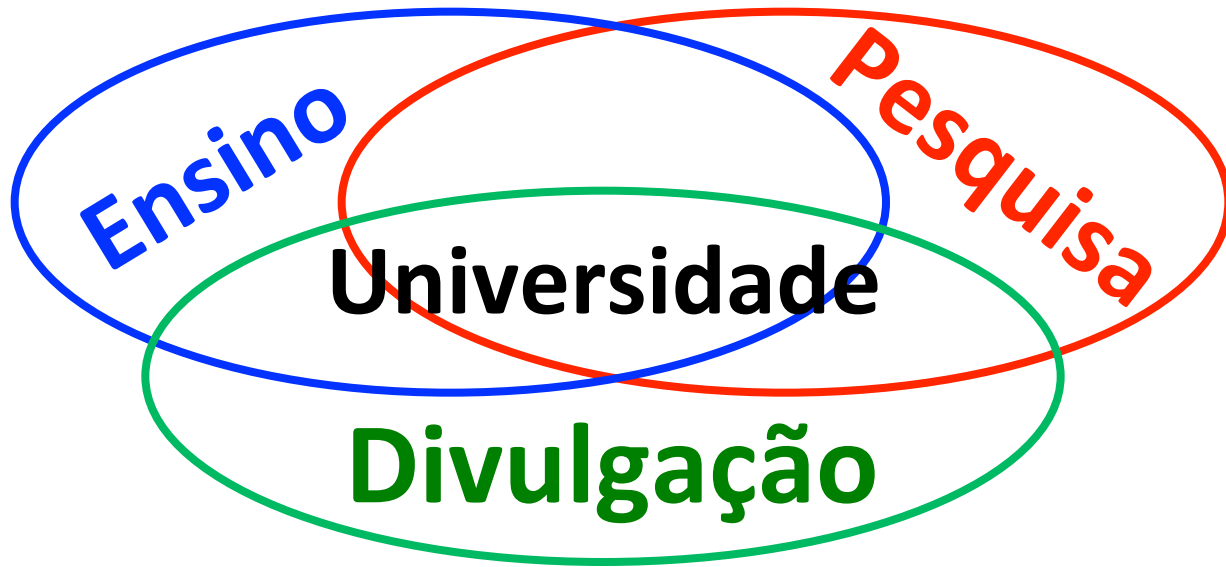


- Theoretician with basic understanding of observations
- Writing proposals+++

- Observer with good understanding of theory
- Writing proposals++



# Maria Luisa Aguilar, UNMSM/Peru



UNIVERSIDAD NACIONAL MAYOR DE SAN MARCO  
FACULTAD DE CIENCIAS FISICAS  
SEMINARIO DE ASTRONOMIA Y ASTROFISICA

SAA



ECLIPSE TOTAL DE LUNA  
28-29 de Noviembre de 1993

JORGE L. MELENDEZ, MARIA LUISA AGUILAR

DEPARTAMENTO DE EDICIONES Y DIFUSION SAA  
NOVIEMBRE 1993



SPACE



Mestrado, INPE  
*Hanumant Sawant*



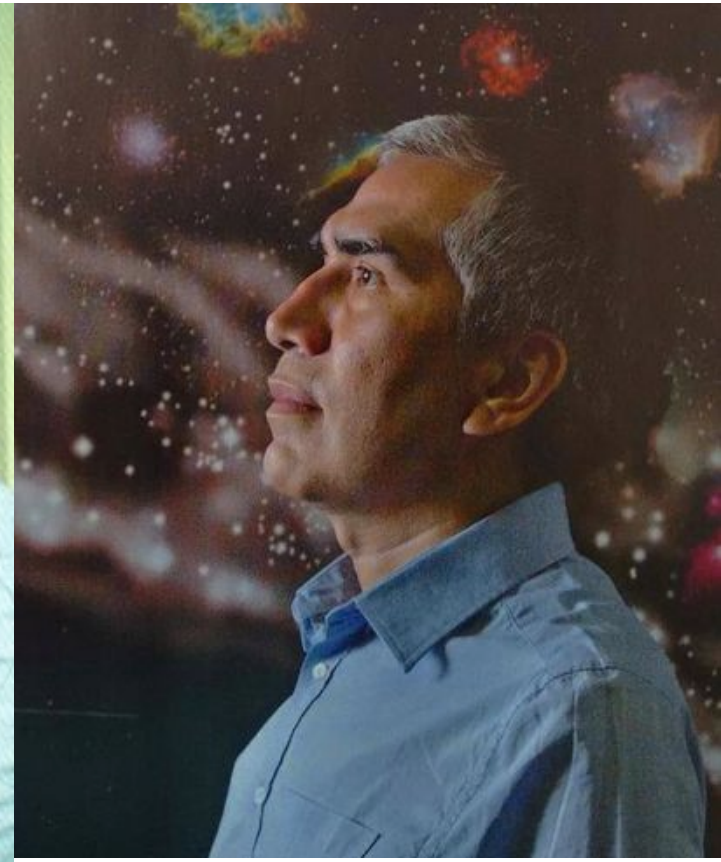
Doutorado, USP  
*Beatriz Barbuy*



*Judy Cohen*, primeiro pósdoc, Caltech



# Complementaridade



Observer+++ Theory+  
Programmer+++ English+++  
Organization+++ Outreach  
Big Picture++

Observer+++ Theory+  
Programming+ English+  
Organization+ Outreach++  
Big Picture+++









# Always aim high



23 de setiembre de 1910

*Whatever happens, I shall be found on the other side of the Alps*

# Jorge Chavez crossing the Alps



Acima sempre acima, até alcançar as estrelas

# A carta de recomendação

- Explicar a relação com o candidato (Professor? Orientador de IC? Supervisor de posdoc?)
- Quanto bem conhece ao candidato? Datas?
- Personalizar a carta com exemplos
- Descrever diversas características do candidato.  
**Se isso não for feito, é assumido que o candidato não tem as qualidades omitidas, ou que essa informação é desconhecida**

# Nota importante

- Nem todas as características são avaliadas
- P.ex., notas na graduação são pouco relevantes para posição de pós-doutorado
- As características importantes dependem muito do tipo de posição.
- Se não for muito bem avaliado em algum quesito pode compensar com outro (p.ex. Pesquisa vs. Histórico escolar)

# Existe a “pessoa perfeita”?

- Não desanime!
- Nem todos os candidatos vão ter todas as características desejadas
- Exemplos a seguir:  
baseados em cartas de recomendação reais



# Características do candidato

## **Scholarship:**

Como foi nos estudos de pós-graduação?

He impressed me as a serious yet personable student, with a good scientific background and an excellent work ethic. (He got an “A”.)

She has fulfilled all her academic degree requirements with a superlative record

# Background for research

She has a very good understanding of the basic physics of stellar evolution and stellar atmospheres

He has a growing and mature understanding of the astrophysical principles of stellar atmospheres



# **Oral communication**

He is a good speaker

# **Written communication**

His technical writing does need some work,  
but he will gain a great deal of practice over  
the next few months

# Motivation (good YES, but learn to say NO)

She always has an energetic “can do” attitude

He proved to be highly motivated

He has a passion for research

In a group of 80 researchers, he stand out with his enthusiasm and involvement in different projects

Her obvious enthusiasm for observational astronomy is successfully carrying her through what could have been an overwhelming project for one person

# Initiative

She has also shown a lot of initiative in talking to people, attending meetings and schools, starting new collaborations.

He has taken the initiative to write several successful telescope proposals

She readily forms collaborations with people of different expertise to realize the goals of the research

# Initiative

In many instances, she would call team meetings and lead the discussions. She has also volunteered to give talks in several institutions.

With great enthusiasm, she has set up a collaboration between stellar and planetary scientists

He has demonstrated very good initiative and enthusiasm, as well as a fast learning curve

# Leadership

He demonstrated a potential for leadership that is unusual in one so early in their graduate career.

Her leadership ability is clear, and I expect her thesis will be a substantial contribution to the field

# Sense of responsibility

In my experience, he is a reliable person

She is also a highly responsible student. She takes her work seriously, and sees it through to completion. She is unusually mature, and very much dedicated to research in astronomy

## Dicas:

- *No matter what* sempre chegar no horário
- *No matter what* sempre entregar no prazo

# Ability to plan and organize

She is impeccably organized and works extremely hard

Analyzing such large numbers of stars is challenging and painstaking work, and she has seen it through with amazing aplomb. She is exceptionally careful.

She is very hard working and organized. She will set her own goals and work diligently towards their completion.

He is methodical in his work

# Research skills

Her observational competence is impressive for a PhD student

He mastered quickly the in-and-outs of our field and learned surprisingly easily how to use a sophisticated code

He has now acquired considerable skills in the analysis of high resolution spectra and abundance determination



# Beyond just analyzing data

He is incredibly thoughtful in his interpretations and analyses of his results

She is also excited about her work, keeping track daily of new publications

He is excellent at seeing the implications of his results on a very wide array of fields and coming up with new problems to solve.

# Tact and ability to relate to other

Personality-wise she is a very nice person to work with.

She is by nature a quiet person, but is open, friendly, and I have had no problem communicating with her

Endosso também outras características importantes num relacionamento profissional; amizade, honestidade e integridade

# **Group interaction and team-working skills**

- She is a very good team member, she is not afraid to take an extra load
- Ele tem um bom espírito de colaboração para trabalho em grupo
- She has an extremely good and collaborative character, allowing her to work very productively in teams.

# Supervising/helping students

- He has been a thoughtful and helpful resource to undergraduates working in my own group

## Helping to organize meetings

He served on the Scientific Organizing Committee and was really instrumental in planning the workshop.

He was a key player in running the Workshop that was hosted here this year

# Participating in group meetings

She has emerged as a scientific leader among our graduate students, serving as a role model for others because of her increasingly deep knowledge of the literature she brings to discussions of scientific issues within her own area and beyond

# Flexibility and adaptability

He has had to overcome a number of serious personal hardships in order to reach this point

He has the confidence to adapt to new circumstances and learn new techniques

He showed a remarkable capacity to work under these circumstances. He was able to quickly adapt

He switched from his past experience in photometry to a new one on high-resolution spectra

# Independence

She has autonomously learned the various procedures for data reduction

He has, from scratch, developed an automated system for deriving stellar parameters

In comparison to her peers in graduate school, she shows a remarkable degree of intellectual independence in her research

I stress that she has achieved this expertise through her own hard work and ingenuity

# Outreach (Divulgação)

Public outreach is one of his interests, and he does well communicating with people who have a wide variety of backgrounds, from the general public, to scientists in different fields

She has been a good citizen in a variety of ways – for example, by acting as our graduate student public outreach coordinator for several semesters and by creating an astronomy competition for the State Science Olympiad



# My evaluation for postdocs

- Papers 1<sup>st</sup> author
- Papers 2<sup>nd</sup> author
- Citations
- Talks: group meetings, seminars, conferences
- Awards (common in the USA)
- Help supervise undergrad students (rare)
- Observing (Proposal? Observer?)
- Instrumentation (rare)
- Grants (rare)

# My evaluation

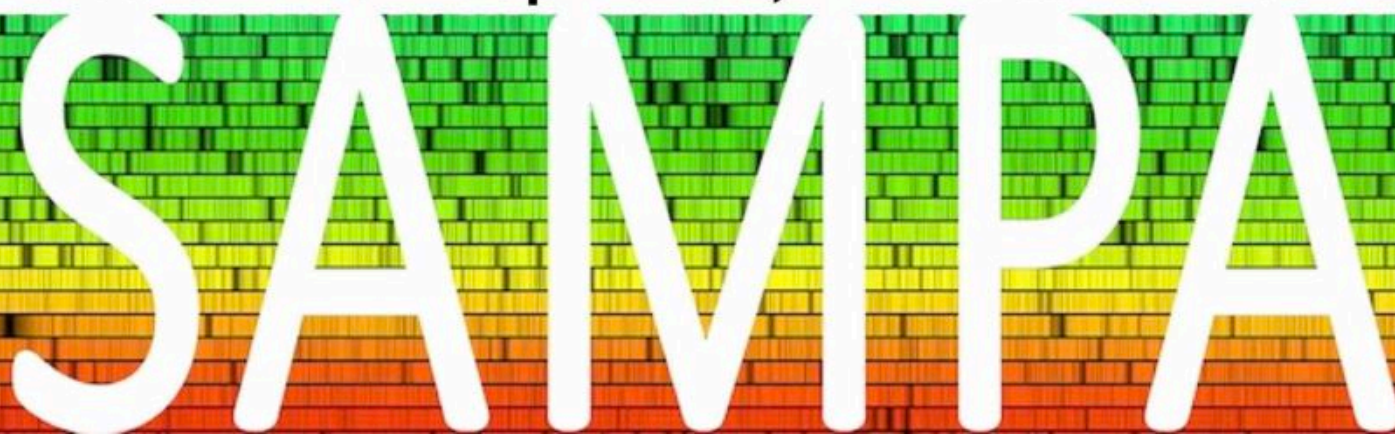
- Participation in conferences/workshops
- Teaching
- Outreach
- Skills for research
- Enthusiasm
- Responsibility
- Astronomy/physics background
- Cover Letter (writing of the letter)
- Achievements (past work, present work)
- Research Plan

# My group: SAMPA

## Stellar AtMospheres, Planets & Abundances

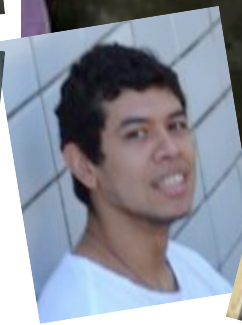
A white silhouette of a city skyline with various building shapes, including a prominent pyramid on the left. The background is a mosaic of blue and white squares.

Stellar Atmospheres, Planets & Abundances

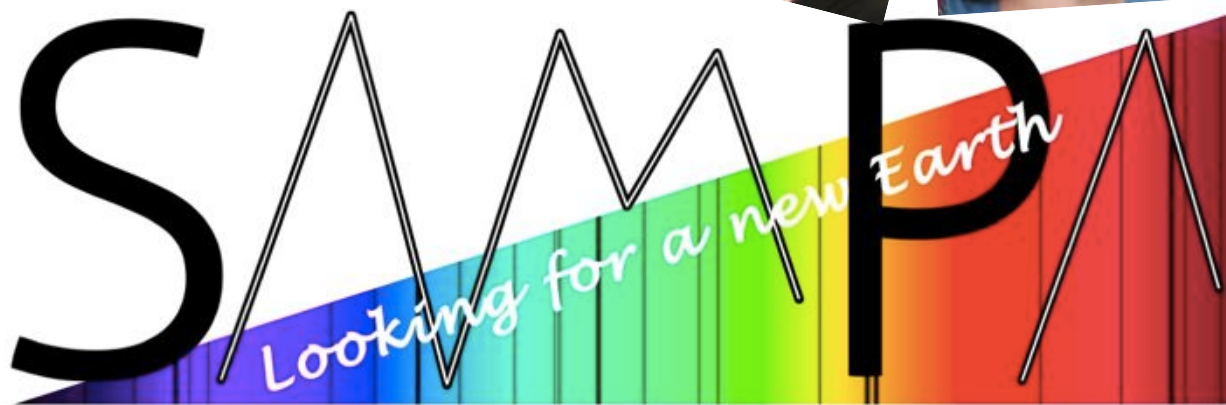
A background of a brick wall with a color gradient from green at the top to orange at the bottom.

# SAMPA

# SAMPA @ IAG/USP



2017: 1 MSc,  
3 PhD, 1 postdoc



Stellar Atmospheres, Planets & Abundances

# SAMPA research topics

- Galactic archaeology

(thin disk, thick disk, halo stars)

- Stellar Astrophysics

(stellar parameters, chemical abundances, rotation, magnetic activity, binaries [white dwarfs])

- Exoplanets

(RV planet search, planet-star connection)

# 15 refereed SAMPa Publications in International Journals in 2016

**Astronomy  
&  
Astrophysics**

A&A 589, A65 (2016)  
DOI: [10.1051/0004-6361/201527477](https://doi.org/10.1051/0004-6361/201527477)  
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## Serendipitous discovery of the faint solar twin Inti 1<sup>★</sup>

Jhon Yana Galarza<sup>1</sup>, Jorge Meléndez<sup>1</sup>, and Judith G. Cohen<sup>2</sup>

<sup>1</sup> Universidade de São Paulo, IAG, Departamento de Astronomia, São Paulo, Rua do Matão 1226, 05508-090 SP, Brasil

[10.1051/0004-6361/201527439](https://doi.org/10.1051/0004-6361/201527439)  
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Monthly Notices

of the  
ROYAL ASTRONOMICAL SOCIETY

MNRAS 457, 3934–3948 (2016)  
Advance Access publication 2016 January 29

**First high-precision different metal**

Henrique Reggiani<sup>1</sup>, Jorge Meléndez<sup>1</sup>, D

<sup>1</sup> Universidade de São Paulo, Instituto de Astronomia, Geofísica e Ciências Atmosféricas, Rua do Matão 1226, Cidade Universitária, 05508-900 São Paulo, Brasil

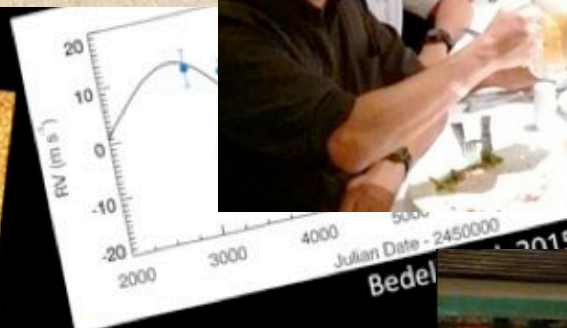
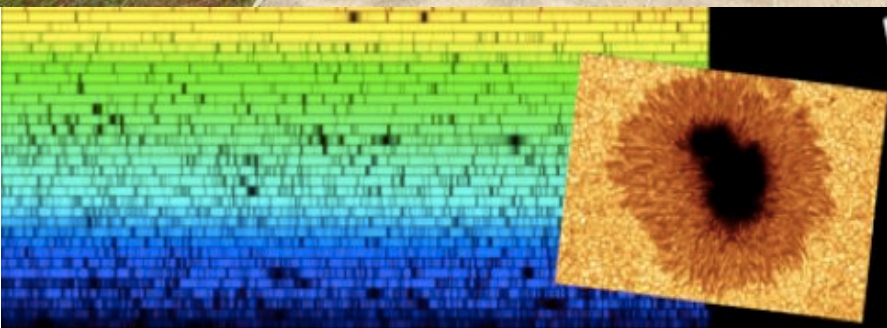
**The Hyades open cluster is chemically inhomogeneous**

F. Liu,<sup>1★</sup> D. Yong,<sup>1</sup> M. Asplund,<sup>1</sup> I. Ramírez<sup>2</sup> and J. Meléndez<sup>3</sup>

<sup>1</sup> Research School of Astronomy and Astrophysics, Australian National University, Canberra, ACT 2611, Australia

<sup>2</sup> McDonald Observatory and Department of Astronomy, University of Texas at Austin, 2515 Speedway, Austin, TX 78712-1205, USA

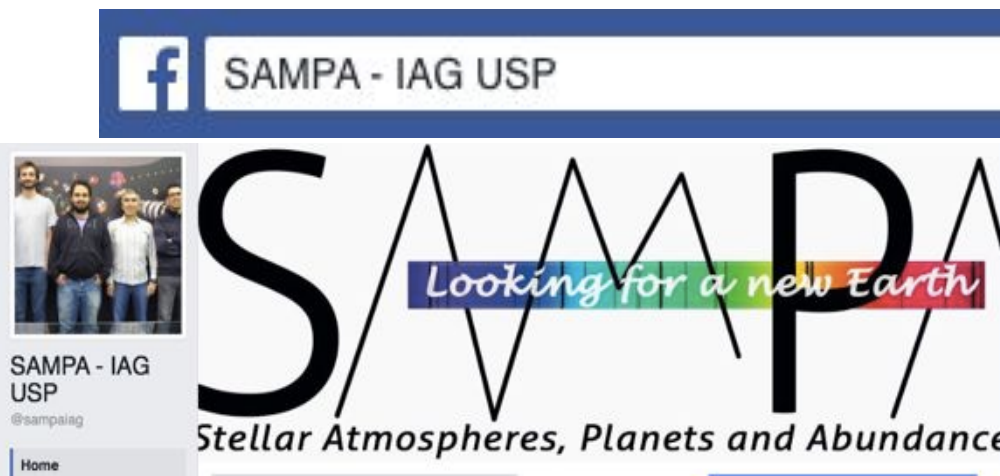
<sup>3</sup> Departamento de Astronomia do IAG/USP, Universidade de São Paulo, Rua do Matão 1226, São Paulo 05508-900, SP, Brasil



**Precision Spectroscopy 2017**  
**Towards Earth 2.0**  
*São Paulo, 1-4 August 2017*



<https://www.facebook.com/sampaig/>



Facebook profile header for SAMPA - IAG USP. The header features the Facebook logo, the name "SAMPA - IAG USP", and a large stylized "SAMP" logo. Below the logo, the text "Looking for a new Earth" is written in a colorful font, and "Stellar Atmospheres, Planets and Abundance" is written in a smaller font. A small profile picture of three people is visible on the left.



Facebook post from SAMPA - IAG USP, dated November 4 at 5:44pm. The post includes a profile picture of three people and a red logo with a white "G1" symbol.

Matéria sobre a descoberta de super-Terra e super-Netuno pelo nosso grupo:  
<http://g1.globo.com/.../cientistas-brasileiros-descobrem-dois...>  
See Translation



Facebook post from SAMPA - IAG USP, dated November 23 at 3:37pm. The post includes a profile picture of three people and the text "SAMP - IAG USP added 2 new photos." Below the post, there is a text block in Portuguese: "Hoje às 14h Prof. Jorge Meléndez ofereceu palestra no IAG-USP para alunos e professores sobre a procura de gêmeas solares e o Sistema Solar 2.0!" and a link "See Translation".





https://twitter.com/AstroUSP



## AstronomiaUSP Brasil

@AstroUSP

Divulgação em Astronomia, IAG/USP,  
São Paulo, Brasil. Prof. Jorge Melendez.  
Astronomy outreach at Univ. São Paulo,  
Brazil.

📍 São Paulo, Brasil

🔗 [twitter.com/DrJorgeMelendez](https://twitter.com/DrJorgeMelendez)

📅 Participa desde agosto de 2014

### Resumo de 28 dia(s)

Tweets

178 ↑ 41,3%

Impressões do Tweet

456 mil ↑

Tweets

13,3 mil

Seguindo

190

Seguidores

4.808



AstronomiaUSP Brasil @AstroUSP · 21 h

Agradeça Júpiter

Ele evita que Netuno chegue perto demais  
e dê um chute letal nas nádegas terráqueas

[@revistagalileu](#)

[revistagalileu.globo.com/Ciencia/notici...](https://revistagalileu.globo.com/Ciencia/notici...)

# GALILEU

Buscar

OK

👍 Curtir 1,4 M

🔗 🐦 📷 📺 📌 📡

## Astrônomos da USP descobrem dois novos planetas

E eles revelam a trágica história de um terceiro planeta engolido por sua estrela



<http://pertodouniverso.blogspot.com.br>

## Divulgação de Astronomia



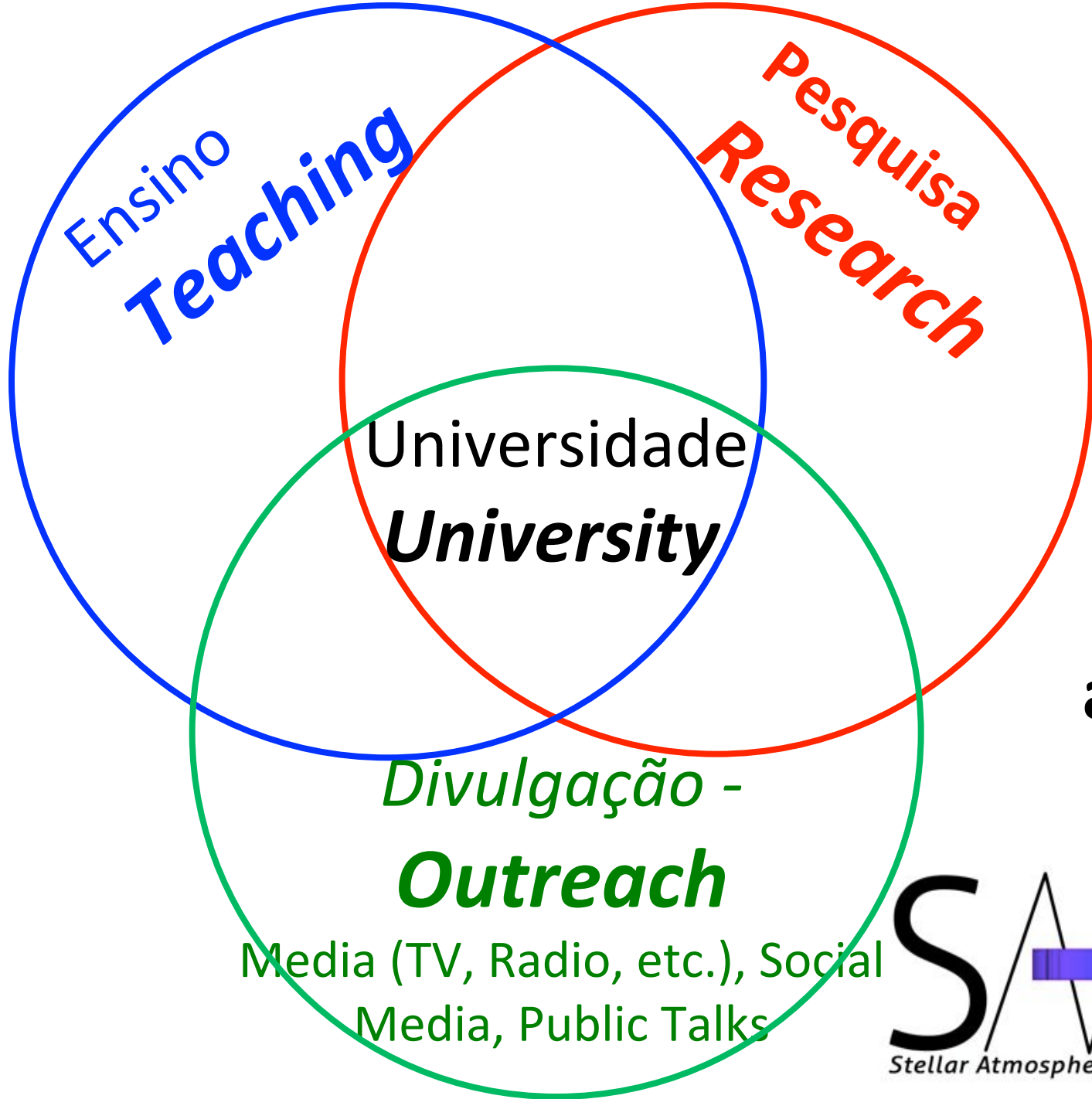
domingo, 20 de novembro de 2016

## O ciclo de matéria no Universo

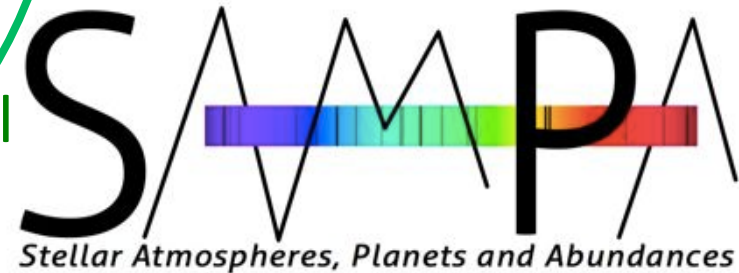
Por Victoria Pardiniho, Giovani Vicentin e Rafael Ishida, alunos do Pro

**Cada um dos elementos da tabela periódica por evolução do nosso Universo.**





**Making  
scientists  
and public  
closer**





Jorge Melendez

@DrJorgeMelendez

# Cuts in funding for Science in Brazil

Corte no orçamento destrói a ciência brasileira.

Participe da Marcha pela Ciência, domingo 8/out 15:00 MASP Av. Paulista

#TodosPelaCiência

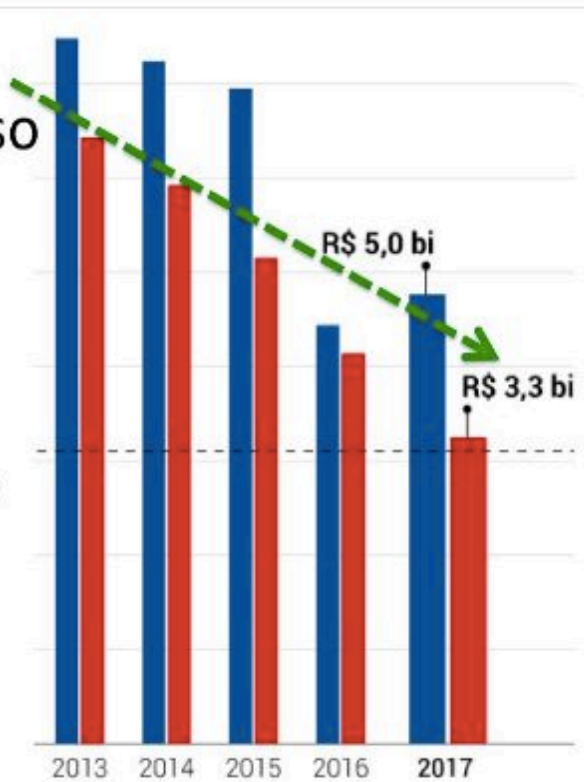
Ciência em retrocesso

Cortes comprometem fortemente o futuro do país

■ Investimento previsto para pesquisa  
■ Orçamento executado

Fonte: Academia Brasileira de Ciências e MCTI

© Veja





First March for Science,  
April 2017



Third March for Science,  
Av. Paulista, 8/out/2017



**Jorge Melendez**

@Dr.JorgeMelendez

Quem roubou de alguns a sede de mudança?

"Até bem pouco tempo atrás  
Poderíamos mudar o mundo  
Quem roubou nossa coragem?"

[#LegiãoUrbana](#)



Não deixe ninguém roubar a sua coragem, a sua coragem de sonhar, de lutar pelos seus sonhos, de lutar por um país melhor, por um mundo melhor