# Report of the National Institute of Science and Technology in Astrophysics (INCT-A) – 2009-2014

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***What is the INCT-A? – An executive summary***

***Context***

*Brazilian Astronomy, although young, has already made some important achievements. The first graduate programs were established in the 1970´s and, since then, the community experimented continuous and vigorous growth. Today nearly 30 institutions support of astronomical research at some level. The first scientific equipment were planned and built in the early 1970´s; an important strategic step was the construction of LNA – the first (and for long time the only one) national laboratory to operate in Brazil. Thanks to this laboratory, Brazilian Astronomy experienced a growth, both in quantity and in quality. This allowed joining the Gemini and SOAR consortia in the 1990´s. These consortia operate world class astronomical instruments.*

*The situation of optical and infrared astronomy is, thus, quite favorable. The participation in the Gemini and SOAR consortia has put our community in contact with the best practices of science management and, at the same time, integrated networks of specialists. Although the SOAR telescope does not have its full instrumentation operational, we already can state that Brazilian contribution to the publications of both Gemini and SOAR consortia is at the highest ranking. At the same time the perspective of world–class instrumentation has revitalized the various groups and attracted young talented people to the graduate programs.*

*For the next decade, world astronomy is planning new and significant steps. At all wavelengths, a next generation of telescopes is under construction: optical 20-40m class (GMT, TMT, ELT) telescopes, radio-interferometers (ALMA, SKA), a new generation of space-borne instruments (IXO, Webb) and a large deep optical survey telescope (LSST). Many of these equipments are multinational initiatives, given the high costs involved, some of them, in the range of a billion dollars and will take 10 to 15 years to be built. Direct*

*participation in such projects is beyond our possibilities, but there are niches from which our astronomy may benefit. The form and intensity of these benefits depend on some new investments but mostly on careful and strategic planning. If this is not done, our community will have less and less opportunities in the international scenarios for the coming decades.*

*In the present INCT, a significant number of researchers from many institutions meet, to plan and implement actions, having in mind the future of Brazilian Astronomy. We are researchers from diverse institutions and of distinct specialties, but we all need the same scientific infrastructure and above all, similar collective strategies.* ***These*** *are the characteristics that provide the* ***unity*** *to this initiative. These strategies are more and more necessary, given the high costs of the new research equipment and timescales needed for their construction.*

*Our community already has a national laboratory (LNA) that operates the national infrastructure in optical and infrared astronomy. The INCTA aims toward a partnership with LNA and other institutions to mobilize the community in fostering the best insertion of Brazilian Astronomy in the great international projects underway and those that still will be proposed.*

*Moreover, we want to promote the culture of technological innovation by supporting the development of world class instrumentation aimed at basic research.*

*If in the recent past Brazilian Astronomy has advanced in a significant way, its future depends on our planning and organization capabilities. New large and expensive projects are under way in the developed countries, many of them in the form of international consortia, given their high costs, which are prohibitive toward our direct participation. However it is possible to create alternative routes, identifying niches that can bring benefits to our science through creative strategies of international cooperation.*

*Such associations will increase the networking, both institutional and individual, showing us the best international practices of organization, planning and management of science. This effort is of fundamental importance to provide the environment for the next generation of scientist to perform frontier research.*

*The "Instituto Nacional em Ciência e Tecnologia em Astrofísica – INCTA", in addition to the host institute, has one associated laboratory (LNA), 3 other MCT research institutes, 14 federal universities, 3 state universities and 6 private universities, comprising a total of 32 research groups, 12 being consolidated and 20 emerging ones in 27 different institutions. A total of 173 PhD scientists are joining the institute; 79 of them have CNPq scientific productivity fellowship, 12 being level 1A.*

***Misssion***

*The mission of the National Institute of Science and Technology in Astrophysics is to insert Brazilian Astronomy into the future of the World Astronomy.*

***Strategic Goals***

***1- Maximizing the return from the Gemini and SOAR telescopes.***

*a) Scientific return: Brazil already presents the highest productivity index among the Gemini partners (Brazilians have used 2.3% of the time and published 10% of the papers). For the SOAR telescope this statistical comparison is still premature as the telescope was built about 5 years later than Gemini. Surely the numbers that matter are not only the number of papers. Quality is also relevant. As a goal, we propose that Brazil maintains the*

*leadership in scientific productivity for both Gemini and SOAR consortia for the next 5 years.*

*b) Graduate programs: There are 11 graduate programs that offer Master+PhD programs in Astronomy (USP; UFRGS; UFMG; ON; INPE; UFRN; UFSC; UNIVAP; UFSM; OV-UFRJ, FEG-UNESP). Another 4 offer master degree only (UNICSUL; UNIFEI; UESC; UERN). The possibilities opened with the access to the Gemini and SOAR telescopes have attracted many new talented people to Astronomy. Today we have a good number of promising talented young people in our graduate programs and integrating them in the scientific production with the use of large telescopes and world-class instruments is one of the most effective ways of attracting and educating more talented people. Our goal is to double the number of papers published by Brazilian graduate students with data from the Gemini and SOAR telescopes in the next 3 years (2009-11 compared to 2006-08) with a following growth of 15% per year.*

*c) Supporting emerging groups: Besides attracting and educating talented people, we also want them to get a job in our country. Our major research institutes seem to be saturated growth wise. At the same time, the vast majority of universities do not have a single astronomy professor. In recent years Brazilian Astronomy has, in fact, experimented a new phenomenon: non-traditional universities, both public and private, have hired a number of young and productive astronomers in their faculty. These new groups, often very small in number, need to be supported, integrated in networks and have access to the best existing equipment. Our goal is to double the number of papers published with authors from emerging groups with data obtained from Gemini, SOAR and alike, for the next 3 years, followed by a growth of 15% per year. Among other incentives, INCTA will provide support to their research, by supplying computer equipment to researchers that obtain observing time with large telescopes provided they are justified within the aims of the Institute. We propose to support the participation of people from emerging groups in scientific meetings when presenting results from large telescopes. These groups will also have access to financial support to foster national and international networking, that is, contact with scientists for seminars, to avoid intellectual isolation, as most of these groups are located far from the main centers.*

*d) Stimulate the development of instrumentation for the Gemini and SOAR telescopes. The Brazilian participation in the Gemini and SOAR consortia has allowed, for the first time, the effective construction of modern instruments for large telescopes. Currently Brazil is concluding the construction of the SIFS – SOAR Integral Field Spectrograph – with 1300 fibers, capable of operating with adaptive optics. Other two instruments are in distinct phases of construction: the Steles (high resolution spectrograph) and the BTFI (Fabry-Perot large field imaging spectrograph). Our goal: to conclude the construction and commissioning of the three instruments underway and begin a new one in the next three years.*

***2 – Brazilian Astronomy in the era of the LSST and ELT projects.*** *The next generation of large telescopes is being planned now. The GMT, TMT and E-ELT are in the process of starting their construction. It is important for Brazilian astronomy to establish a strategy for the era of ELTs, that will be operational by the year 2020. The Large Synoptic Survey*

*Telescope, on the other hand, is a North-American initiative for building and operating a telescope of 6.5 m effective aperture (8.4m nominal) to monitor the sky in 6 filters. This will be a deep survey with an unprecedented approach in the sense that it will revisit the same regions in the sky at about every 4 days, so that it will add a temporal dimension to the data. The magnitude limit for single observations will be r ~24 and it will have a cumulative limit of r~27.5. This project has 4 main broad goals: a) the nature of dark energy and dark matter; b) The transient sky; c) The structure of the Milky Way and d) The structure of the Solar System. This project will make some observations available in real time having profound impact on Brazilian Astronomy.*

***3 – Virtual observatories**. Great part of the data from space missions and also from ground based telescopes is available in databases. These datasets contain a wealth of information and mining them may be of enormous benefit to Brazilian Astronomy, without proportional financial investments. Significant effort in software is imperative to make the appropriate and necessary development. Our goal is to have an operational network of virtual observatories in Brazil within the next 3 years.*

***4 – New projects of scientific equipment**. A minimum of 3 new projects, to be defined by the Science committee, will be elaborated and proposed: at least one in radio-astronomy, at least one scientific satellite and at least one in optical/infrared astronomy. These projects will be elaborated to the point where they can be presented to the funding agencies or to possible international partners.*

*5 – **Education activities:** Brazil has currently about 300 000 teachers of Science and Mathematics. The content and knowledge of Astronomy is minimum. We propose to organize a distance learning course on Astronomy for science teachers all over the Country. The idea is to establish a virtual ambient for an online "distance learning course". We propose to establish partnerships with the State Governments and Universities to create a large network to foster this idea.*

# *INCT-A: Institutions*

*INCT-A is a network of 173 researchers of the following institutions*

***Host Institution:***
*Instituto de Astronomia, Geofísica e Ciências Atmosféricas – Universidade de São Paulo*

***Associated Laboratory:***
*Laboratório Nacional de Astrofísica – LNA*

***Associated Universities and Institutes (33):***

1. **FURG – Fundação Universidade do Rio Grande – RS*
2. **UCS – Universidade de Caxias do Sul - RS*
3. **UDESC – Universidade para o Desenvolvimento do Estado de Sta. Catarina - SC*
4. **UEFS – Universidade Estadual de Feira de Santana - BA*
5. **UEL – Universidade Estadual de Londrina -PR*
6. **UFABC – Universidade Federal do ABC-SP*
7. **UFJF – Universidade Federal de Juiz de Fora-MG*
8. **UFPel – Universidade Federal de Pelotas-RS*
9. **UFS- Universidade Federal de Sergipe - SE*
10. **UFSCar - Universidade Federal de São Carlos – SP*
11. **UFSM – Universidade Federal de Santa Maria-RS*
12. **UNICSUL – Universidade Cruzeiro do Sul - SP*
13. **UNIFEI – Universidade Federal de Itajubá-MG*
14. **UNIFESP - Universidade Federal de São Paulo - SP*
15. **UNIPAMPA – Universidade Federal do Pampa-RS*
16. **UNIVAP- Universidade do Vale do Paraíba - SP*
17. **UNIVASF – Universidade Federal do Vale do São Francisco-PE*
18. *Centro Brasileiro de Pesquisas Físicas - CBPF*
19. *CTA/MD – Comando Tecnológico da Aeronáutica – SP*
20. *Instituto Nacional de Pesquisas Espaciais – INPE*
21. *Observatório Nacional – ON*
22. *UESC – Universidade Estadual de Santa Cruz – Ilhéus/BA*
23. *UFMG – Universidade Federal de Minas Gerais-MG*
24. *UFRGS – Universidade Federal do Rio Grande do Sul-RS*
25. *UFRJ – Universidade Federal do Rio de Janeiro-RJ*
26. *UFSC – Universidade Federal de Santa Catarina-SC*
27. *UNB – Universidade de Brasília - DF*
28. *UNESP – Universidade Estadual Júlio de Mesquita Filho-SP*
29. *Universidade Presbiteriana Mackenzie – SP*
30. **UFSJ – Universidade Federal de São João Del Rey – MG*
31. **UFV – Universidade Federal de Viçosa - MG*
32. **UFPA – Universidade Federal do Pará – PA*
33. **UFRR – Universidade Federal de Roraima - RR*

*(*) – Emergent groups*

# 1. Results obtained by the INCTA in the period 2009-2014.

We will report here our main results obtained during the last 6 years. It is important to notice that this INCT is quite large (and productive in terms of papers published). Its nature is quite distinct from the vast majority of the others in the sense that it has a strategic approach. We want to address issues that we believe to be essential for the future of Brazilian Astronomy.

**1- Maximizing the return from the Gemini and SOAR telescopes.**

***a) Scientific return***

When the INCTA was proposed, Brazilian astronomy was growing at a rate of ~1% per year. This was a rate much smaller than its previous growth of 11% during the period 1970-2000. The program proposed by INCTA has a very clear strategic nature, to change this rhythm and insert Brazilian Astronomy in the international scene.

The Gemini and SOAR telescopes offer the possibility reach such a goal. After 6 years, it is time to assess the current status. In the following table (Table A) we show the number of papers per telescope in the period 2001-2014.

**Talbe A - Comparative table of papers produced by biennium (2001-2014)**

| | ***Gemini*** | ***SOAR*** | ***CFHT*** | ***OPD*** | ***Total*** |
|---|---|---|---|---|---|
| 2013+14 | 44+1* | 26+4* | 9+1* | 27 | 104+1**+6* |
| 2011+12 | 32+1* | 12+3* | 1+2* | 31+2* | 76+8* |
| 2009+10 | 29 | 11+5* | - | 29 | 69+5* |
| 2007+08 | 23 | 8+2* | - | 27 | 58+2* |
| 2005+06 | 14 | 6+1* | | 47 | 67+1* |
| 2003+04 | 8 | 0+2* | | 36+1* | 44+3* |
| 2001+02 | 1 | | | 43 | 44 |
| Até 2000 | | | | 235 | 235 |
| Total | 150+2* | 61+16* | 9+3* | 473+3* | 699+23* |

Papers with (*) are on instrumentation.
Papers with data from more than one telescope have (**).

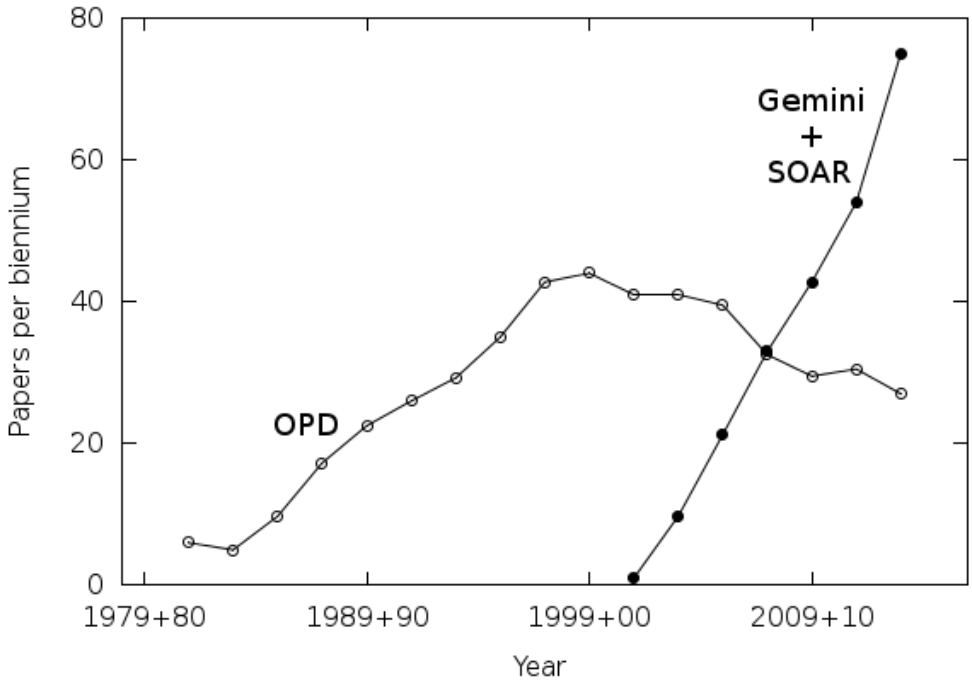


*Figure 1. Number of papers per biennium published with data from the telescopes managed by LNA.*

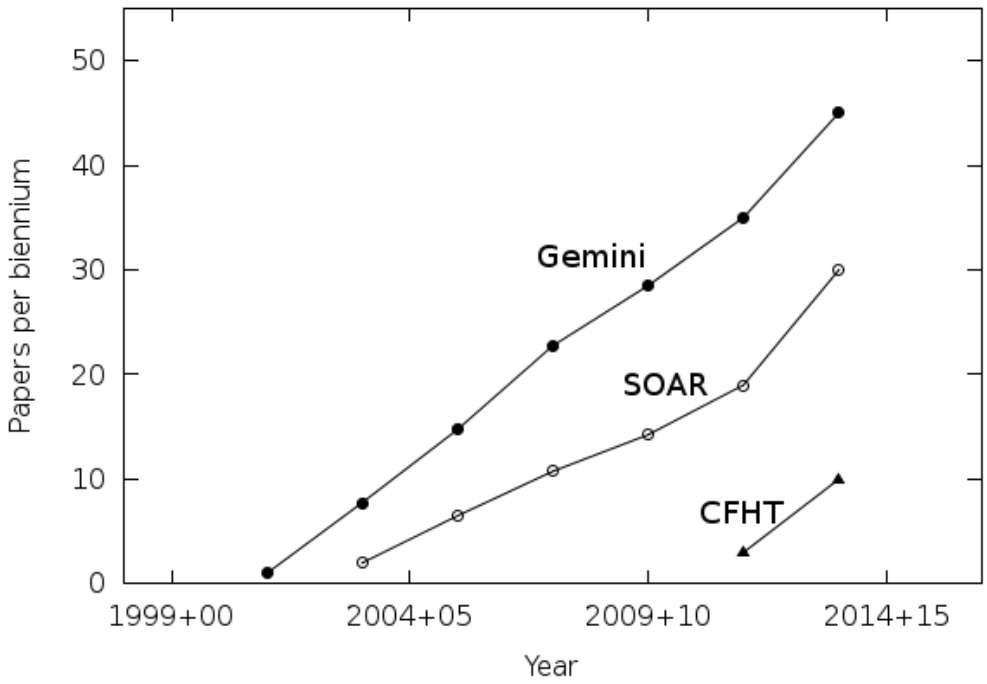


*Figure 2. Number of papers per biennium published with data from the telescopes Gemini, SOAR and CFHT by the Brazilian community.*

**Table B – Comparative table of brazilian authors vs total of Gemini.**

| | ***2001-10*** | ***11+12*** | ***2013*** | ***2014*** |
|---|---|---|---|---|
| Nr *papers* total Gemini | 824 | 354 | 202 | 224 |
| Nr *papers* w/ brazilian auth. | 75 | 31 | 17 | 27 |
| Nr *papers* w/ 1$^{o}$ aut. brazilian | 60 | 24 | 11 | 19 |
| % use of time by Brasil | 2.3% | 4.6% | 5.5% | 5.5% |
| % of *papers* w/ brazilian auth. | 9.1% | 8.8% | 8.4% | 12.1% |
| % of *papers* w/ 1$^{o}$ auth. brazilian | 7.3% | 6.8% | 5.4% | 8.5% |

In recente years, the papers published with Gemini + SOAR data presented a growth rate of 17% per year. This speaks by itself. At the same time Table B shows that the number of papers published by Brazilian astronomers is significantly higher than the average of the partnership. It is clear that the Gemini and SOAR telescopes are showing their scientific production at a progressive pace. The tendency seen in Figure 1 suggest that this tendency will continue.

In recent years Brazilian astronomers have hsed 5.5% of the telescope time and published 12.1% of the papers. In 8.5% of the total papers published with Gemini data, 8.5% have Brazilians as first author.

### *b) Graduate programs*

During the 4 years of 2005-08 the number of Master and PhD theses based on data from Gemini+SOAR telescopes was 15. During the 4 subsequent years, 2009-12 this number increased to 32. From 2007+08 to 2011+12 the growth rate was 15% per year. In the biennium of 2013+ 2014 the number increased to 26; again a significant increase when compared to the previous biennium, as shown in Table A. This shows that in this particular area of astronomy, the growth is quite significant. The contribution of the Gemini and SOAR telescopes is, perhaps, even more convincing here than in the scientific production, as shown n Figure 3.

**Table C - Caomparative table of Master and PhD theses, per biennium (2001-2014)**

| | *Gemini* | *SOAR* | *CFHT* | *OPD* | *Total* |
|---|---|---|---|---|---|
| 2013+14 | 15 | 9+2* | 5 | 11 | 35+2*+2** |
| 2011+12 | 9 | 8+2* | 2 | 17+1* | 33+3*+3** |
| 2009+10 | 5 | 6+2* | - | 15 | 26+2* |
| 2007+08 | 10 | 1 | - | 11 | 20+1** |
| 2005+06 | 4 | - | | 10 | 14 |
| 2003+04 | 1 | | | 16 | 17 |
| 2001+02 | 2 | | | 12 | 14 |
| Up to 2000 | | | | 94+3* | 94+3* |
| Total | 46 | 24+6* | 7 | 184+4* | 258+10* |

Masters in instrumentation are with (*).
Theses with data from more than one telescope are with (**).

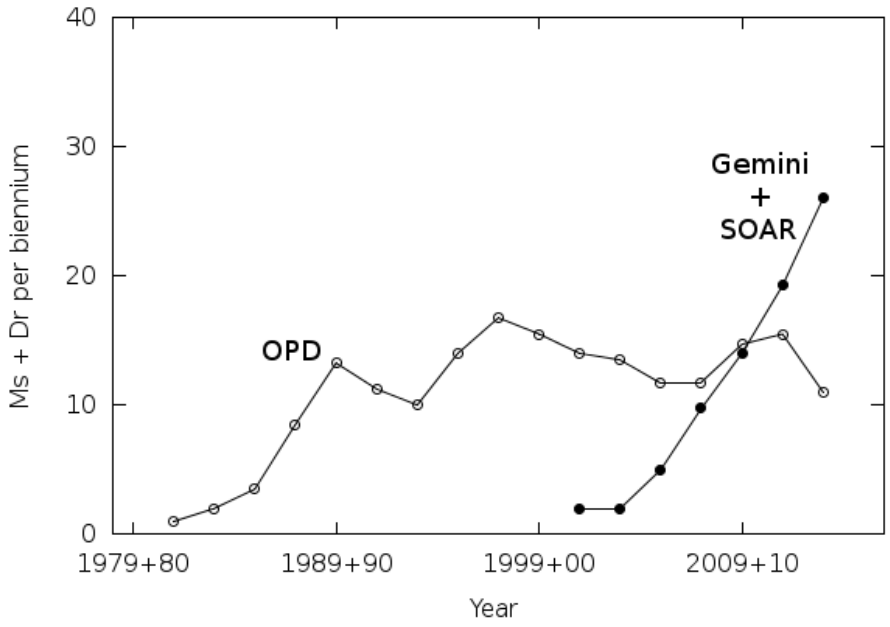


*Figure 3. The number of Ms and PhD theses containing data from telescopes managed by LNA.*

As can be seen in Table D, The number of master and PhD theses is growing at an increasing pace (currently, about 13% for Masters and 6% fot PDs).

*Table D*

| | *Ms* | *Dr* |
|---|---|---|
| *2005-2007* | *89* | *59* |
| *2008-2010* | *98 (3.3% p/year)* | *60 (0.6% p/year* |
| *2011-2013* | *143 (13.4% p/year)* | *71 (5.8% p/year)* |

***c) Supporting emerging groups***

During the 6 years of INCTA, a total of 21 lap-top and 15 desk-top computers were allocated to the emerging groups. In addition, 2 Virtual Observatory servers where also allocated.

The INCTA provided Astronomy books to 19 institutions with emerging groups.

A great effort in providing fellowships to emerging groups was also made. 49 IC, 7 Ms and 1 Dr fellowships where allocated to them. Perhaps as a consequence, the growth rate of Ms degrees has significantly improved in recent years.

***d) Stimulate the development of instrumentation for the Gemini and SOAR telescopes.***

According to Table C, the first Master Theses in instrumentation for large telescopes started in the period 2009-2012, when a total of 4 theses where obtained.

At the same time, the number of instrumentation papers increased by a large factor, going from 3 in the period of 2005-08 to 13 in the four following years. An increase of 41% per year between 2007+08 and 2011+12.

More importantly, the largest amount of money allocated by INCTA during the last 6 years was to the instrument BTFI (Brazilian Tunable Filter Imager). This instrument has commissioning on the SOAR telescope and its first images have been obtained (see below). The instrument SIFS (SOAR Integral Filed Spectrograph) was also supported by the INCTA, but at lower level, basically for transportation expenses and commissioning.

The number of Brazilian authors in instrumentation pares is 7 for the Gemini telescope and 43 for the SOAR telescope. This is quite impressive for an area that was much smaller previous to the SOAR telescope instrumentation program.

Figure 4 - The BTFI

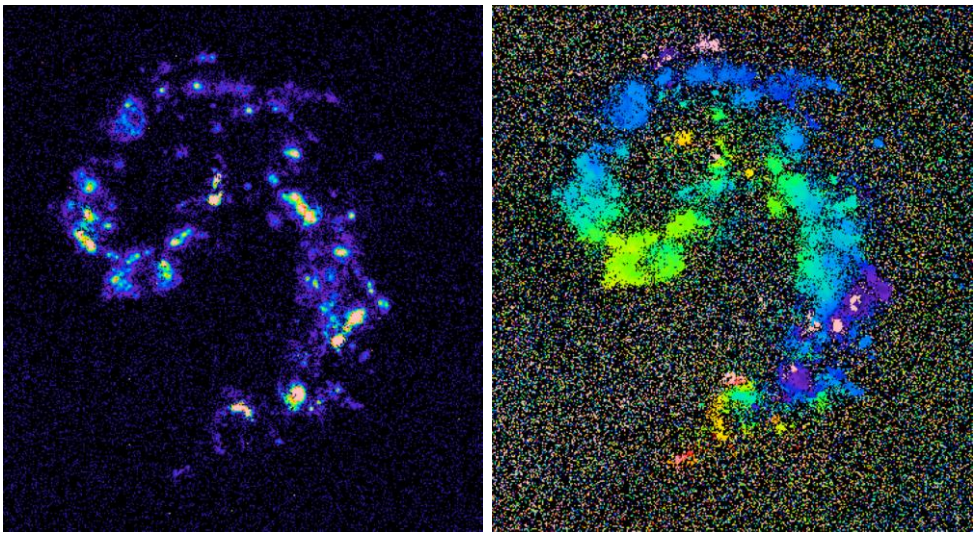

*Figure 5 - Images of the the Antena Galaxy obtained with the Fabry-Perot with the SAM adaptive optics module.*

**Table E - Number of Brazilian authors (2001-2012)**

| | ***Gemini*** | ***SOAR*** | ***CFHT*** |
|---|---|---|---|
| Nr of Brazilian authors in papers with data | 93 | 65 | 0 |
| Nr of Brazilian authors in instrum. papers | 7 | 43 | 1 |

## 2 – Brazilian Astronomy in the era of the LSST and ELT projects.

In the year 2012 (April 1 to 4) an important workshop was held in Campos do Jordão:

***Science with the LSST: a Brazilian/US Joint Workshop***
In this meeting both the Brazilian as the US side presented their perspectives and potential use and development for this telescope.

It is important to mention that FAPESP has joined the GMT Consortium as a founding member. It will hold 4% of the observing time.

## 3 – Virtual observatories.

The year of 2012 was very rich in activities regarding the BRAVO (Brazilian Virtual Observatory) initiative. The following activities and events where held:

- *Primeiro Workshop de e-Science na Astronomia Brasileira*
  09/03/12 – IAG-USP – S. Paulo – SP

- *Bravo Challenge*
  May/12 - October/12

- *Trilha de Astronomia na XXXII Reunião Anual da SBC +SAB*

  * *VO Day in SAB*

  * *Bravo VO School*

- *Interoperability Meeting to IVOA*
  (INCTA+Sociedade Brasileira de Computação)
  July/12 a October/12

- XXXII Congresso da Sociedade Brasileira de Computação – BRAVO
  Curitiba

**4 – New projects of scientific equipment**

Two instruments were supported by INCTA to this point:
1 - The LLAMA radio dish that has the purpose to make interferometry with the ALMA interferometer. In funding stage by FAPESP.
2 – JPAS (Javalambra Physics of Accelerating Universe). This is meant to build and operate a 2.5 m telescope for Cosmology. It is a joint Brazil-Spain consortium to install the telescope in Spain.

**5 – Education activities: EAD – Science teachers training program**

After 2 years of development, the first course for science teachers was held in 2011. The course lasted 18 weeks and the conclusion was that it should take longer. The number o teachers approved, per year since 2011 is given in Table F. The names of the approved teachers are given in Appendix B.

**Table F - "CURSO DE ASTRONOMIA PARA DOCÊNCIA"**

| ANO | REALIZAÇÃO | APOIO | MATR. | APROVADOS | TIPO DE CURSO |
|---|---|---|---|---|---|
| 2011 | EACH | INCTA | 100 | 43 | APERFEIÇOAMENTO |
| 2012 | EACH | INCTA | 164 | 46 | APERFEIÇOAMENTO |
| 2013 | EACH / IAG | INCTA | 272 | 35 | APERFEIÇOAMENTO |
| 2014 (*) | IAG / IF | INCTA / IAG | 80<br><br>--------<br>50 | 15 – SISTEMA SOLAR<br>----------<br>24-ASTROFÍSICA | ATUALIZAÇÃO<br><br>APERFEIÇOAMENTO |

(*) From 2014 on, the course was given in two parts:
- Sistema Solar – 130 horas / Atualização
- Astrofísica – 240 horas / Aperfeiçoamento

# 2. General production of papers by INCTA members

The total number of papers published by the INCTA members in international refereed papers during the period 2009-14 was 1070. Of these papers, 84% were published in journals classified as Qualis A by CAPES. The number of papers published by journal per year is given in Appendix A.

*Table G - Papers published in refereed journals by the researchers*

| *Year* | *Total papers* | *Qualis A* | *Qualis B* | *Others* |
|---|---|---|---|---|
| *2009* | *148* | *83%* | *11%* | *6%* |
| *2010* | *177* | *78%* | *12%* | *10%* |
| *2011* | *185* | *86%* | *5%* | *9%* |
| *2012* | *174* | *83%* | *2%* | *15%* |
| *2013* | *185* | *86%* | *6%* | *8%* |
| *2014* | *201* | *88%* | *4%* | *7%* |
| *Total* | *1070* | *84%* | *6%* | *9%* |

# 3. Investments made in the period 2009-2014

**Acquisition of computer facilities for emerging groups (2009-2014):**

- **21 Lap-top computers:**

1. *Alexandre Soares de Oliveira (UNIVAP)*
2. *Cássio Barbosa (UNIVAP)*
3. *Fabrício Ferrari (UNIPAMPA)*
4. *Gabriel Hickel (UNIFEI)*
5. *Hecktor Monteiro (UNIFEI)*
6. *Lucimara Martins (UNICSUL)*
7. *Nádja Magalhães (UNIFESP)*
8. *Paulo Afrânio Lopes (OV-UFRJ)*
9. *Sergio Pilling (UNIVAP)*
10. *Wilton Dias (UNIFEI)*
11. *João Maria Silva (UFCG)*
12. *Kelly Torres Dozinel (UFSJ)*
13. *Marcelo Guimarães (UFSJ)*
14. *Diana Pilling (UNIVAP)*
15. *Natalia Landin (UFSJ)*
16. *Carlos Dutra (UNIPAMPA*
17. *Rose Clívia Santos – UNIFESP*
18. *João Vital da Cunha Junior - UFPA*
19. *Luciano Fraga - LNA*
20. *Tiago Ribeiro de Souza - UFS*
21. *Ana Cristina Moreira Machado Zadra Armond - UFSJ*

- ***14 Desk-Top computers:***

1. *André Ribeiro (UESC)*
2. *Antonio Guimarães (UFRJ- Macaé)*
3. *Diego Falceta-Gonçalves (USP-Leste)*
4. *Gabriel Hickel (UNIFEI)*
5. *Gustavo Lanfranchi (UNICSUL) x2*
6. *Henry Plana (UESC)*
7. *Irapuan Rodrigues (UNIVAP)*
8. *Ivan Soares (UNB)*
9. *Rogemar Riffel (UFSM)*
10. *Antonio Guimarães (UFRJ – Macaé)*
11. *Alexandre Zabot (UFSC-Joinvile)*
12. *Rodrigo Fernandes de Lira Holanda – UEPB x2*
13. *Sergio Scarano Junior - UFS*

***Videocon equipment***

*Sílvia Lorenz (UFRJ)*
*Sergio Scarano Junior- UFS*
*SOAR remote observing room (IAG)*

**Virtual Observatory servers:**
*Paula Coelho (UNICSUL)*

*Roberto Cid Fernandes (UFSC)*

***SOAR remote observing stations***

*Raimundo Lopes (UFS)*
*Alexandre S. de Oliveira (UBIVAP)*

***No-breaks:***

1. *No-break for the IAG cluster Alfa Crucis*
2. *No-break for EaD*

***Astronomical data reduction and analysis office***

*Alexandre S. de Oliveira (UNIVAP)*
*06 Desktops*

***Teaching equipment***

Carlos Dutra – UNIPAMPA:
*01 Newtonian telescope*
*20 binocules 10x50*

*Antonio Kanaan Neto – UFSC:*
*Optical light modulator*

**Acquisition of Astronomy books for emerging groups**

1. 2x UESC
2. FURG
3. UEFS
4. UFABC
5. UFCG
6. UFRJ/Observatório Valongo
7. UFRJ-Macaé
8. UFS
9. UFSC
10. UFSC - Joinvile
11. UFSJ
12. UFSM
13. UFV
14. UNICSUL 2x
15. UNIFEI
16. UNIFESP
17. UNIPAMPA
18. UNIVAP 2x
19. UNIVASF

**Acquisition of computer facilities for community use**

*High Performance GPU processor*

Alex Carciofi (IAG-USP)
This equipment, running at 2.3 teraflops, has been installed at IAG-USP for community use.

*Desk-top computer were allocated to people working for the INCT-A*
Carlos Paladini (IAG-USP)
Anne Louise Scarinci (IAG-USP)
Maria Teresa Lopes (IAG-USP)

*The super cluster Alfa Crucis installed at IAG-USP was opened to all INCTA members with the investment made by INCTA.*

**International Travel (2009-2011)**

- Visit to ALMA (Chile)
- Visit to TMT and GMT (Pasadena CA-USA)
- PFS (Los Angeles – USA)
- J-PAS (Terruel - Spain)
- SPIE Astronomical Telescopes and Instrumentation (San Diego-USA)
- Asymmetric Planetary Nebulae V (UK)-Denise Gonçalves
- Virtual Observatory (Munich - Germany)
- Virtual Observatory (Victoria - Canada)
- Gemini users training (Tucson – USA)
- Visit to SPARTAN (Chile)
- Observation mission to IRTF (Hawaii)
- Virtual observatory (Naples - Italy)
- Workshop Astro-informatics 2011 - Sorrente, Itália
- Visit to the Open University (EaD) Milton Keynes, England
- Meeting with LSST – Tucson AZ USA
- Meeting with CFHT – Hawai USA
- J-PAS meeting – Terruel, Spain
- 15 trips to La Serena for the Comissioning of the SOAR instruments SIFS and BTFI

**International Travel (2012)**

*BTFI Comissioning* - TOTAL: 14 trips

Janeiro: Henri Plana, Fabricio Ferrari e Renato Severo
Maio: Denis Andrade
Julho: Alvaro, Denis Andrade, Bruno Quint, Claudia Oliveira e Keith Taylor
Setembro: Denis Andrade
Novembro: Denis Andrade, Álvaro Calasans e Claudia Oliveira
Janeiro/2013: Bruno Quint

*SIFS Comissioning – TOTAL: 6 trips*

Maio: Orlando Verducci e Flavio Ribeiro (La Serena)
Julho: Orlando Verducci (La Serena)
Janeiro/2013: Rodrigo Vilaça, Ligia Oliveira e João Batista Oliveira (treinamento nos EUA)

*BraVO*
Maio: Alex Carciofi e Paula Coelho (IVOA interoperability meeting 2012, University of Illinois)

*Other trips:*

Fevereiro: André Amorim, Antonio Kanaan, Fabricio Ferrari e Henrique Xavier – (Reunião J-PAS em Madrid)
Maio: Vinicius Placco (Colaboração científica com a profa. Anna Frebel no MIT (Massachussets Institute of Technology)
Junho: Anne Scarinci (participação no The World Conference on Physics Education, Istanbul)
Julho: Denise Gonçalves, Eduardo Telles, Rogemar Riffel, Rogerio Riffel, Astor Schonell e Marlon Diniz (participação no Gemini Science Meeting, San Francisco)
Agosto: Bruno Castilho (The 2012 LSST All Hands Meeting,Tucson)
Dezembro: Marcos Lima – (reunião cientifica do Dark Energy Survey (DES), Texas A&M University)

**International travel (2013-2014)**

- Bruno Vaz Castilho de Souza
Período: 25 a 31/03/2013
Participação no workshop "The Next Generation of the CFHT: A wide field spectroscopic facility for the coming decade"

- Henri Michel Pierre Plana
Período: 10 a 18/ 05 / 2013
Science with SITELLE, Quebec / Canadá

- Lucimara Pires Martins
Período: 19 a 27/05/13
Observação no Telescópio APO - Procurando pelas estrelas pós-AGB ionizantes - Apache Point Telescope, New Mexico, EUA

- Karín Delmestre
Período: 10 a 14/06/2013
"A Panchromatic View of Galaxy Evolution 30 Years after the Infrared Astronomical Satellite (IRAS)", Paphos, Cyprus.

- Raimundo Lopes de Oliveira Filho
Período: 15 a 20/06/2014
Participação no evento The X-ray Universe 2014, Dublin, Irlanda

- Treinamento nos Observatórios Gemini e SOAR
Período: 18 a 26/09/2013
Camila Maria Sitko Meira dos Santos
Ingrid Domingos Pelisoli

Henrique Marques Reggiani
André Sampaio

- Marcelo Medeiros Guimarães
Período: 24/12/2013 a 04/01/2014
Observação no Telescópio SOAR

- Hugo Vicente Capelato
Período: 11 a 18/01/2014
Participação no evento "The evolution of galaxy clusters and cluster galaxies in the epoch of large optical/IR surveys" - Sexten/Itália

- Paula Rodrigues Teixeira Coelho
Período: 03 a 10/10/2014
Colaboração com Dr. Stephane Charlot do Institut d'Astrophysique de Paris (auxílio parcial)

- Paula Rodrigues Teixeira Coelho
Período: 17 a 21/11/2014
Participação no evento "Third Workshop on Numerical and Observational Astrophysics: Linking the Local Universe to the Early One", Buenos Aires

- Alex Cavalieri Carciofi
Período: 30/11 a 05/12/2014
Simpósio 305 da IAU  Polarimetry: From the Sun to Stars and Stellar Environments", Costa Rica

**Foreign visitors:**

- Christine Jones Forman (Harvard-Smithsonian Center for Astrophysics)
Período: 27/08 a 06/09/2014
colaboração científica entre UFRJ e Harvard-Smithsonian Center for Astrophysics, palestras na UFRJ e no XXXVIII Reunião anual da SAB

- Roland Christian Francis Triay (Aix Marseille Université)
Período: 17  a  22 / 02 / 2013
Participação no evento Verão Quântico 2013

- Charles David Fisher (California Institute of Technology)
- David Frederick Braun (California Institute of Technology)
Período: 11  a  17/ 08 / 2013
Treinamento de eletrônica e micromecânica de precisão para o Laboratório Nacional de Astrofísica - California Institute of Technology

**SIFS**
Chicago: 04
La Serena: 3
Montréal: 3

**BTFI**: 19 (La Serena)

**GMTO**: 04 (Pasadena and Texas)

**BRAVO**: 04

**JPAS**: 04 (Spain)

**Support to Instrumentation (2009-2014)**

- SIFS – SOAR Integral Field Spectrograph
- BTFI –Brazilian Tunable Filter Interferometer
- STELES – SOAR Telescope Echelle Spectrograph
- LLAMA- Latin-American Astronomical Millimetric Array
- JPAS –Javalambra Physics of the Accelerating Universe
- SPARC4 - A simultaneous polarimeter and rapid camera in 4 bands

## Events held in 2009 - 2011

*Space Astronomy in Brazil*
IAG-USP, held in September 2009
INCT-A + INCT INESPAÇO

*Instrumentation*
USP-São Carlos, School on Instrumentation for Astronomy and Organic Electronics held in September 2010.
INCT-A + INCT Organic Electronics

*The ASTER project*
Sao Jose dos Campos, 27/10/2010
INPE+INCT-A

*Verão Quântico 2011*
Anchieta ES 20 a 25/2/2011
CAPES+CNPq+INCTA

*First International Symposium on Science with the SOAR Telescope*
Maresias, SP – 13-19/05/11
INCTA+LNA

*I Workshop de Computação Científica em Astronomia*
UNICSUL 02-05/06/11
INCTA

*Workshop LLAMA*
FAPESP – 8 e 9/08/11
INCTA

*South American Gemini Data Workshop*
S. Jose dos Campos, 27-30/10/2011

**Events held in 2012**

*Primeiro Workshop de e-Science na Astronomia Brasileira*
09/03/12 – IAG-USP – S. Paulo - SP
INCTA

*Science with the LSST: a Brazilian/US Joint Workshop*
Campos do Jordão 01 a 04/04/2012
INCTA+LNA

*Bravo Challenge*
May/12 - October/12
INCTA

*Trilha de Astronomia na XXXII Reunião Anual da SBC +SAB*

** VO Day in SAB*

** Bravo VO School*

** Interoperability Meeting to IVOA*
(INCTA+Sociedade Brasileira de Computação)
July/12 a October/12

*Reunião do J-PAS*
São Paulo

*XV Curso de introdução à Astronomia e Astrofísica*
INPE

*XXXII Congresso da Sociedade Brasileira de Computação – BRAVO*
Curitiba

*III International Conference on Quantum Theories and Renormalization Group in Gravity and Cosmology*
Grupos Emergentes (UFJF)

*Conference: Galactic Nuclei and Their Connection With Stars and the Environment*
UFRGS – Gramado

**Events held in 2013**

- 17 a 22/02/2013
*5º Verão Quântico*
Local: Anchieta / ES

- 26 a 28/04/2013
*Treinamento para observações remotas no Telescópio SOAR*
Local: São José dos Campos / SP

- 27 a 28/05/2013
*BTFI meeting*
Local: São Paulo

- 15 a 19/07/2013
*XVI Curso de introdução à Astronomia e Astrofísica*
Local: São José dos Campos / SP

- 13 a 14/11/2013
*GMT Science Workshop*
Local: São Paulo

- 25 a 30/11/2013
*XIV Latin American Regional IAU Meeting*
Local: Florianopolis / SC

**Events held in 2014**

- 03 a 06/06/2014
*II Workshop de Computação Científica em Astronomia*
Local: São Paulo / SP

- 30/06 a 04/07/2014
*XVII Curso de introdução à Astronomia e Astrofísica*
Local: São José dos Campos / SP

- 07 a 09/08/2014
*Rompendo a barreira do desconhecido – Como aproveitar os novos instrumentos do Gemini e do SOAR*
Local: Guarujá / SP

***FELLOWSHIPS ALLOCATED BY THE INCT-A***

**Fellowships: IC (2009-2011)**

1. Adam Smith Gontijo Brito de Assis (Orientador: Ivan Soares Ferreira/UNB)
2. Aghata Harumi da Costa (Orientadora: Rose Clívia dos Santos/UNIFESP)
3. Anderson Seiji Okada (Orientadora: Nadja Magalhães/UNIFESP)

4. Ariana Franca Clavia (Orientador: Luiz Paulo Vaz/UFMG)
5. Dalton Dias Meira (Orientador: Francisco Carlos R. Fernandes/UNIVAP)
6. Arthur Eduardo da M. Loureiro (Orientador: Horácio Dottori/ UFRGS)
7. Calliu Icaro da Silva Soares Rosa (Orientador: Militão Figueiredo/ UNIVASF)
8. Davi Rohe Salomon da Rosa Rodrigues (Orientador: Daniel Müller/UNB)
9. Dino Beghetto Junior (Orientador: Irapuan Rodrigues Oliveira Filho/UNIVAP)
10. Elizabete Guitzel (Orientadora: Nadja Magalhães/UNIFESP)
11. Felipe de Paula Lima (Orientador: Ivan Soares Ferreira/UNB)
12. Filipe Fontanela (Orientador: Raymundo Baptista/UFSC)
13. Francisco Elânio Bezerra (Orientador: Gustavo Lanfranchi/UNICSUL)
14. Frederico Guilherme de Oliveira (Orientador: Sergio Pilling/UNIVAP)
15. Frederico Vilela de Lima (Orientador: Anderson Caproni/UNICSUL)
16. Gabriel Martins Palma Perez (Orientador: Jorge Melendez/IAG)
17. Gabriela Augusta Prando (Orientador: Gustavo Rojas/UFSCAR)
18. Graciana Brum João (Orientador: Fabrício Ferrari/ FURG)
19. Guilherme Muller Peccini (Orientador: Horacio Dottori/UFRGS)
20. Jose Declerk Buaca Sinadinse (Orientador: Francisco Carlos Rocha Fernandes/UNIVAP)
21. Helder José Farias Lima (Orientador: Alexandre Soares de Oliveira/UNIVAP)
22. Jamille Almeida Feitosa (Orientadora: Maria Jaqueline Vasconcelos/UESC )
23. Levy Scalise Maciel (Orientador: Tatiana Michtchenko/IAG)
24. Luenne Nailam Sousa Nascimento (Orientador: André Luis Batista Ribeiro/UESC)
25. Luis Fernando Basso (Orientador: Odilon Giovannini/UCS)
26. Marcos Antonio Fonseca Faria (Orientadora: Tania Domicini/LNA)
27. Mariana Arantes Mazzi (Orientador: Augusto Damineli/IAG)
28. Nyergton Barreiros dos Santos Costa (Orientador: Militão Vieira Figueredo/UNIVASF)
29. Pablo Chagas Oliveira (Orientadora: Thaisa Storchi-Bergmann/UFRGS)
30. Rafael Luiz Bernardi (Orientador: Abílio Mateus Jr/ UFSC)
31. Rafael Pantaleão Moreira (Orientador Oli Dors Jr/ UNIVAP)
32. Renato da Silva Severo (Orientador: Fabricio Ferrari /UNIPAMPA)
33. Renato Mello da Silva Farias (Orientador: Wagner Marcolino/Observatório do Valongo)
34. Rodrigo Voivodic (Orientador: Laerte Sodré Junior/IAG)
35. Sergio Henrique M. Douwens dos Santos (Orientador: Valerio Carruba/UNESP)
36. Thiago Marcel de Almeida Santana (Orientador; Iranderly Fernandes/UEFS)
37. Wagner Schlindwein (Orientador: Raymundo Baptista/UFSC)
38. Walter Silva Martins Filho (Orientadora: Thais Mothé Diniz/OV) Alexandre Campos
39. Vergueiro Monteiro de Almeida (orientador Caius Selhorst/UNIVAP)

**Fellowships "Iniciação Científica" – 2012**

1 - Alexandre Campos Vergueiro Monteiro de Almeida, orientador: Caius Selhorst / UNIVAP
2 - Andrea Elisabete de Paula, orientador: Odilon Giovannini / UCS
3- Ariana Franca Clavia, orientador: Luiz Paulo Vaz / UFMG
4 - Caio Cézar Gomes Laranjo, orientador: Alexandre Oliveira / UNIVAP

5 - Carolyne Santos de Oliveira, orientadora: Karin Delmestre / Observatório do Valongo
6 - Cilon Vianna Leão, orientadora: Daniela Pavani / UFRGS
7 - Eduardo Lourenço de Andrade, orientador: Raymundo Baptista / UFSC
8 - Elvis William Carvalho Cantelli, orientadora: Beatriz Barbuy / IAG
9 - Fábio Pinto Rodrigues, orientador: Alberto Ardila / LNA
10 - Frederico Guilherme de Oliveira, orientador: Sergio Pilling / UNIVAP
11 - Gabriel Martins Palma Perez, orientador: Jorge Melendez / IAG
12 - Gabriela Augusta Prando, orientador: Gustavo Rojas / UFSCAR
13 - Giovane Galdino da Silva, orientador: Caius Selhorst / UNIVAP
14 - Guilherme Müller Peccini, orientador: Horacio Dottori / UFRGS
15 - Jessica Caroline dos Santos Simplício, orientador: Jorge Melendez / IAG
16 - João Vitor Frossard, orientador: Ilya Shapiro / UFJF
17 - Jose Declerk Buaca Sinadinse, orientador: Francisco Fernandes / UNIVAP
18 - Leonardo Augusto Gonçalves dos Santos, orientador: Hektor Monteiro / UNIFEI
19 - Leonardo de Albernaz Ferreira, orientador: Fabricio Ferrari / FURG
20 - Levy Scalise Maciel, orientadora: Tatiana Michtchenko / IAG
21 - Lucas Gustavo Gonçalves Pimenta, orientador: Eduardo Cypriano / IAG
22- Luenne Nailam Sousa Nascimento, orientador: André Ribeiro / UESC
23 - Luis Fernando Basso, orientador: Odilon Giovannini / UCS
24 - Luiz Filipe Hermes Calvi, orientador: Antonio Guimarães / UFRJ-Macaé
25 - Marcus Vinícius Araújo Moreno, orientador: Antonio Guimarães / UFRJ-Macaé
26 - Mariana Arantes Mazzi, orientador: Augusto Damineli / IAG
27 - Nyegirton Barreiros dos Santos Costa, orientador: Militão Figueredo / UNIVASF

**Fellowships "Iniciação Científica" – 2013**

1) Pedro Antonio Batista Brito (Henri Plana)
2) Isabel de Jesus Lima (Eduardo Amores)
3) Pietro Soares Ramalho (Rose Clivia)
4) Andressa Rossini Goulart (Carlos Dutra)
5) Pedro Papini de Araujo (Eduardo Bica)
6) Caio Rodrigues dos Santos (Valério Caruba)
7) Eduardo Luann Wojcikiewicz Duarte Silva (Raymundo Baptista)
8) Marcos Felipe Faria Terra Siqueira (Gabriel Hickel)
9) Natasha Fioretto Aguero (Tatiana Michtchenko)
10) Otavio MiIgliavacca Madalosso (Haroldo Velho)

**Fellowships: master (2009-2011)**

1. Alexandre Bergantini de Souza (Orientadora: Diana Andrade/UNIVAP)
2. André Luiz de Amorim (Roberto Cid Fernands/UFSC)
3. Astor Leão Schonell Jr (Orientador: Rogemar Riffel/UFSM)
4. Bruno Correia Mota (Alex Carciofi/ IAG-USP)
5. Fellipy Dias Silva (Orientadora: Thais Idiart/IAG-USP)
6. Iara Tosta e Melo (Orientador: Anderson Caproni/ UNICSUL)
7. Luciana de Oliveira Ruiz (Orientador: Gustavo Lanfranchi/UNICSUL)
8. Suzi Izaquiel Ferreira Diniz (Orientadora: Lucimara Martins/UNICSUL)
9. William Schoenell (Orientador: Roberto Cid Fernandes Junior/UFSC)

**Fellowship: Doctorate (2009-2011)**
Carlos Augusto Molina Velasquez (Paulo Afrânio Augusto Lopes/OV-UFRJ)

**Fellowship: Technological and industrial development (2009-2013)**

1. Áurea Garcia (LNA)
2. Marília Jobim Sartori (LNA)

**Fellowship: Apoio Técnico-Nível Superior - 2012 / 2013:**

1 - Juliano Romani / UFSC

**Fellowships: Post-Doctorate (2009-2011)**

1. Anne Louise Scarinci Brandao (Orientador: Diego Falceta Gonçalves-EAD/USP)
2. Cintia Quireza Campos (Orientadora: Denise Rocha Gonçalves/OV-UFRJ)
3. Daniela Borges Pavani (Orientador: Eduardo Bica/UFRGS )
4. Dinah Moreira Allen (Orientador: Diego Falceta Gonçalves-EAD/USP)
5. Iranderly Fernandes de Fernandes (LNA)
6. Marcos Vinicius Borges Teixeira Lima (Orientador: Laerte Sodré/IAG-USP)
7. Marina Trevisan (Reinaldo Carvalho/INPE)
8. Natalia Vale Asari (Orientador: Roberto Cid Fernandes Junior/UFSC)
9. Paulo Fernando Penteado (Cláudia Mendes de Oliveira/IAG-USP)
10. Tiago S. Gonçalves (Paulo Afrânio Lopes/OV-UFRJ)

**Fellowships: Post-Doctorate – 2012/2013**

1 - Denilso da Silva Camargo / UFRGS
2 - Dinah Moreira Allen / EACH
3 - Francisco Ferreira de Souza Maia / UFMG
4 - Marina Trevisan / INPE

**Fellowships: Visiting Fellow (BEV-A)**
Noemi Pinilla-Alonso (Orientadora: Thais Mothé-Diniz/UFRJ)

**Appendix A**
**SCIENTIFIC PRODUCTION – 2009/2014**

**Table A1 - Distribution of the papers published by the INCT-A researchers in 2009, by journal**

| Journal | Qualis | Nr of papers | % |
|---|---|---|---|
| A&A | A2 | 34 | 23 |
| MNRAS | A2 | 35 | 23 |
| ApJ | A1 | 27 | 18 |
| PhRvD | A2 | 10 | 7 |
| AJ | A2 | 10 | 7 |
| PhRvL | A1 | 1 | 1 |
| AstL | s/c | 1 | 1 |
| CoPhC | s/c | 1 | 1 |
| JCAP | A1 | 5 | 3 |
| PhLB | A2 | 3 | 2 |
| Icarus | B1 | 2 | 1 |
| GReGr | B2 | 1 | 1 |
| AdSpR | s/c | 4 | 3 |
| APh | B3 | 1 | 1 |
| P&SS | s/c | 1 | 1 |
| CeMDA | B4 | 1 | 1 |
| ApSS | B4 | 4 | 3 |
| RMxAA | B1 | 1 | 1 |
| New Astron | B2 | 2 | 1 |
| IJMPA | B3 | 3 | 2 |
| PASJ | B1 | 1 | 1 |
| PASA | s/c | 2 | 2 |
| Ast L | s/c | 1 | 1 |
| PhRvL | A1 | 1 | 1 |
| CoPhC | s/c | 1 | 1 |

**Total 148 papers:**

**83% Qualis A**
**11% Qualis B**
**6% Others**

**Table A2 - Distribution of the papers published by the INCT-A researchers in 2010, by journal**

| Journal | Qualis | Nr of papers | % |
|---|---|---|---|
| A&A | A2 | 45 | 25 |
| MNRAS | A2 | 36 | 20 |
| ApJ | A1 | 25 | 14 |
| PhRvD | A2 | 13 | 7 |
| AJ | A2 | 9 | 5 |
| JCAP | A1 | 6 | 3 |
| Icarus | B1 | 4 | 2 |
| IJMPA | B3 | 8 | 4 |
| AdSpR | s/c | 6 | 3 |
| APh | B3 | 2 | 1 |
| ApSS | B4 | 5 | 3 |
| RMxAA | B1 | 2 | 1 |
| New Astron | B2 | 1 | 1 |
| Nature | A1 | 1 | 1 |
| PhLB | A2 | 2 | 1 |
| PhRvC | A2 | 1 | |
| JphCS | | 2 | |
| IJT | | 1 | |
| EL | | 1 | |
| Cos Re | | 1 | |
| SoPh | | 1 | |
| JGRE | | 1 | |
| CQGra | | 1 | |
| AdAst | | 1 | |
| AN | | 1 | |

**Total: 177 papers**

**78% Qualis A**
**12% Qualis B**
**10% Others**

**Table A3 - Distribution of the papers published by the INCT-A researchers in 2011, by journal**

| Journal | Qualis | Nr of papers | % |
|---|---|---|---|
| A&A | A2 | 40 | 22 |
| MNRAS | A2 | 58 | 31 |
| ApJ | A1 | 40 | 22 |
| PhRvD | A2 | 6 | 3 |
| AJ | A2 | 11 | 6 |
| Icarus | B1 | 2 | 1 |
| IJMPS | B3 | 4 | 2 |
| ApSS | B4 | 2 | 1 |
| RMxAA | B1 | 2 | 1 |
| Nature | A1 | 2 | |
| PhLB | A2 | 1 | |
| PASP | A2 | 2 | |
| CQGra | | 1 | |
| AdAst | | 1 | |
| Others | | 17 | |

**Total: 185 papers**

**86% Qualis A**
**5% Qualis B**
**9% Others**

**Table A4 - Distribution of the papers published by the INCT-A researchers in 2012, by journal**

| Journal | Qualis | Nr of papers | % |
|---|---|---|---|
| A&A | A2 | 41 | 24 |
| MNRAS | A2 | 47 | 27 |
| ApJ | A1 | 39 | 22 |
| PhRvD | A2 | 4 | 2 |
| AJ | A2 | 5 | 3 |

| | | | |
|---|---|---|---|
| JCAP | A1 | 5 | 3 |
| Icarus | B1 | 1 | 1 |
| IJMPA | B3 | 1 | 1 |
| AdSpR | s/c | 3 | 2 |
| ApSS | B4 | | 1 |
| RMxAA | B1 | | 1 |
| New Astron | B2 | 2 | 1 |
| Nature | A1 | 2 | 1 |
| PASP | A2 | 1 | |
| PhRvL | A1 | 1 | |
| JphCS | | 2 | |
| JGRE | | 1 | |
| AdAst | | 1 | |
| Others | | 12 | |

**Total: 174 papers**

**83% Qualis A**
**2% Qualis B**
**15% Others**

**Table A5 - Distribution of the papers published by the INCT-A researchers in 2013, by journal**

| Journal | Qualis | Nr of papers | % |
|---|---|---|---|
| A&A | A2 | 48 | 26 |
| MNRAS | A2 | 55 | 30 |
| ApJ | A1 | 39 | 21 |
| PhRvD | A2 | 8 | 4 |
| AJ | A2 | 5 | 3 |
| JCAP | A1 | 1 | 1 |
| Icarus | B1 | 2 | 1 |
| IJMPA | B3 | 2 | 1 |
| AdSpR | s/c | 2 | 1 |
| APh | B3 | 2 | 1 |

| | | | |
|---|---|---|---|
| ApSS | B4 | 1 | 1 |
| RMxAA | B1 | 3 | 2 |
| New Astron | B2 | 2 | 1 |
| PASP | A2 | 1 | 1 |
| PhRvC | A2 | 1 | 1 |
| PhRvL | A1 | 1 | 1 |
| SoPh | | 1 | 1 |
| JGRE | | | |
| CQGra | | 1 | |
| AdAst | | | |
| AN | | 1 | |
| Others | | 9 | |

**Total: 185 papers**

**86% Qualis A**
**6% Qualis B**
**8% Others**

**Table A6 - Distribution of the papers published by the INCT-A researchers in 2014, by journal**

| **Journal** | **Qualis** | **Nr of papers** | **%** |
|---|---|---|---|
| A&A | A2 | 60 | 30 |
| MNRAS | A2 | 62 | 31 |
| ApJ | A1 | 38 | 19 |
| PhRvD | A2 | 6 | 3 |
| AJ | A2 | 6 | 3 |
| JCAP | A1 | 3 | 1 |
| Icarus | B1 | - | - |
| IJMPA | B3 | 2 | 1 |
| AdSpR | s/c | - | - |
| ApSS | B4 | 4 | 2 |

| | | | |
|---|---|---|---|
| RMxAA | B1 | 1 | - |
| New Astron | B2 | 2 | 1 |
| Nature | A1 | 1 | - |
| PhRvC | A2 | 1 | - |
| PhRvL | A1 | 1 | |
| SoPh | | 1 | - |
| JGRE | | | |
| CQGra | | 3 | |
| AdAst | | 1 | |
| AN | | 2 | |
| Others | | 8 | |

**Total: 201 papers**

**88% Qualis A**
**4% Qualis B**
**7% Others**

**Appendix B - EaD Teachers Approved**

**B1– 2011**

1. Adriana Hitomi Deguchi
2. Ana Paula Freire da Silva
3. Anderson Ramos da Silva
4. Andre Fernando de Sousa
5. Antonio Beltrame
6. Carlos Alberto de Lima
7. Carlos Richard Eduardo Matheus Lizárraga
8. Denise Assis da Silva
9. Eliane Honório de Oliveira
10. Elton Morais Barbosa
11. Fábia Almeida Lino
12. Fabiano de Pádua Conceição
13. Fabio Roberto Lessa de Oliveira
14. Fernando Augusto Silva
15. Francimara Nascimento da Silva Marcondes
16. Hildebrando José Balieiro Ramos
17. Janecléia Alves Lourenço
18. João Wesley da Silva Nunes

19. José Manoel Damas Neto
20. Josué Antunes de Macedo
21. Juraci Pereira Sotero – MATO GROSSO
22. Liliane Pimentel da Silva
23. Luana Neri Thomaz da Silva
24. Lyara Araujo Gomes
25. Margarete Agosta de Arruda
26. Maria Helena Pereira
27. Mauricio Galante Muzetti
28. Michele Aparecida Alves Lopes
29. Miriam Milanelo
30. Nathali Ingrid de Castro
31. Nathália Lopes Valderrama
32. Patrícia Petricone Moraes
33. Paulo Alexsandro Veloso
34. Regiane Souza Pinto
35. Reinaldo Borges Júnior
36. Renata da Silva Cavalcanti
37. Roberta Miyuki Toledo de Amorim
38. Roberto Galvani Felipe
39. Roger Toledo de Amorim
40. Rogério Carlos dos Santos
41. Sibele Cristine Girotto Maziero
42. Valentina Aparecida Bordignon
43. Vitor Pereira Belotto

**B2 – EaD: Approved – 2012**

1. Álvaro Jean Borges Almeida
2. Ana Lucia Cavalca Fernandes Franco de Oliveira
3. Ana Lucia Protásio de Almeida
4. Antonio Carlos da Silva
5. Aparecida Ramos Fortes Pereira
6. Ariana Souza de Santana
7. Áurea Lucia de Oliveira Dantas Albuquerque
8. Breno Alexandre Dalosto
9. Cely Garcia Fernandes Pereira
10. Clélia Scalon de Medeiros
11. Daniel Atkocius Filho
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