



Comisión Nacional de Investigación
Científica y Tecnológica - CONICYT

ESTADO FINAL RESOLUCION DEL CONSEJO	FECHA	<div style="border: 1px solid black; padding: 5px; text-align: center;"><input type="checkbox"/> 1. APROBADO 2. PENDIENTE 3. RECHAZADO 4. A FISCALIA</div>
Observaciones: _____ _____	<div style="border: 1px solid black; display: inline-block; width: 30px; height: 30px; vertical-align: middle;"></div> <div style="border: 1px solid black; display: inline-block; width: 30px; height: 30px; vertical-align: middle;"></div> <div style="border: 1px solid black; display: inline-block; width: 30px; height: 30px; vertical-align: middle;"></div>	

This is only for internal use of FONDAP

EVALUATION REPORT CENTERS FOR ADVANCED RESEARCH

I. PROJECT INFORMATION

CENTER'S NAME

Center for Astrophysics

DIRECTOR

Professor Guido Garay

II. EVALUATION PANEL

NAME	ORGANIZATION/ INSTITUTION	E-MAIL	SIGNATURE
Reviewer 1			

III. PROGRAMS EVALUATION (please fill up as many forms as programs exist within the Center)

PROGRAM'S NAME

Birth and Evolution of Structures in the Universe

PRINCIPAL INVESTIGATOR

Leopoldo Infante

ITEM	Total/ Good	Partial/ Regular	Insufficient/ Deficient	Internal use
Degree of adoption of suggestions from the last report *				
Accomplishment of objectives and goals of the reported program	X			
Quantity of the results reached regarding the objectives and goals	X			
Quality of reached outcomes related to proposal objectives and goals	X			
Degree of integration with other ongoing programs of the Center		X		
Diffusion of the results	X			

Comments: This is a highly visible and very productive program within the Center. The program has a number of ongoing projects, including one of the original key projects (MUSYC). The MUSYC project, and its extension into the infrared, have been very successful and provided much visibility for Chilean astronomy. This program has recently expanded its research into millimeter/submillimeter wavelengths using ACT to both survey deeply for submillimeter galaxies and to study the SZ effect in galaxy clusters. These are good additions to this program and have obvious ALMA follow-up possibilities. Another new and important addition to this research area has been a theory component, which should be a good complement the observational studies. This research area has attracted many graduate students. I note that the research summary is somewhat fragmented, with only snippets of each topic, so it was particularly difficult to understand the new projects that have been recently started.

PROGRAM'S NAME				
Stellar Populations in the Local Universe				
PRINCIPAL INVESTIGATOR				
Doug Geisler				
ITEM	Total/ Good	Partial/ Regular	Insufficient/ Deficient	Internal use
Degree of adoption of suggestions from the last report *				
Accomplishment of objectives and goals of the reported program	X			
Quantity of reached outcomes related to proposal objectives and goals	X			
Quality of reached outcomes related to proposal objectives and goals	X			
Degree of integration with other ongoing programs of the Center	X			
Diffusion of the results	X			

Comments: A large program with many researchers from all three Center institutions. This research area has made important and fundamental contributions to the studies of the chemical and dynamical properties of globular cluster systems, including interesting work on multiple populations. They are leading a new and very exciting key project with VISTA, the Vista Variables in the Via Lactea (VVV). It was not clear in the report how many graduate students are working in this research area, however this is an exciting research area and one I hope has attracted many graduate students. As suggested by a reviewer last year, it would probably be wise to identify links to GAIA. It is also good to see the interaction between this research area and that related to the distance scale.

PROGRAM'S NAME Distance Scale
PRINCIPAL INVESTIGATOR Wolfgang Gieren

ITEM	Total/ Good	Partial/ Regular	Insufficient/ Deficient	Internal use
Degree of adoption of suggestions from the last report *				
Accomplishment of objectives and goals of the reported program	X			
Quantity of reached outcomes related to proposal objectives and goals	X			
Quality of reached outcomes related to proposal objectives and goals	X			
Degree of integration with other ongoing programs of the Center	X			
Diffusion of the results	X			

Comments: The Araucaria Project is an important international collaborative project, and one of the original key projects of the Center. This project is a very visible activity of this research group and is providing improved local calibration of the extragalactic distance scale. The methods developed are being applied to galaxies containing supernovae, which will help calibrate both Type I and II SN as standard candles. The use of eclipsing binaries for distance determination has the exciting prospect of deriving distances to the LMC and SMC to an accuracy of a few %. This a focused program producing important results that are essential for anchoring the distance scale of the universe. There is much overlap with Supernovae and Dark Energy program, and it good to see the collaborative efforts between these two programs. The report did not mention how many graduate students were working in this area.

PROGRAM'S NAME Star Formation
PRINCIPAL INVESTIGATOR Guido Garay

ITEM	Total/ Good	Partial/ Regular	Insufficient/ Deficient	Internal use
Degree of adoption of suggestions from the last report *	X			
Accomplishment of objectives and goals of the reported program	X			
Quantity of the results reached regarding the objectives and goals	X			
Quality of reached outcomes related to proposal objectives and goals	X			
Degree of integration with other ongoing programs of the Center		X		
Diffusion of the results	X			

Comments: This program continues to be very productive. The ATLASGAL survey on APEX is one of the four original key projects and has finished the data collection successfully. This dust continuum survey of the galactic plane at 870 microns provides a significant sample of high mass star forming sites for study. The southern extension of this survey toward Carina makes good sense. I think the molecular spectral line study with MOPRA (MALT90) is particularly exciting, as it will provide physical, chemical and dynamical conditions of a very large sample of dense cores. I also think these projects will produce some obvious ALMA follow-ups programs. The group is also moving forward on an ALMA project to study the gas content of protoplanetary disks. APEX observations will first be used to find candidates for a large ALMA follow-up program that will be undertaken during the early science phase. I think this is an exciting program and was granted a Millenium nucleus. As I have stated in the past, this research program has the most to be gained from ALMA and I hope they develop more projects for the early science phase of ALMA. The study of star formation, particularly of massive stars, will be very important and an area where this group can lead ALMA investigations. This group also organized two important ALMA workshops.

PROGRAM'S NAME Extrasolar Planets and Brown Dwarfs
PRINCIPAL INVESTIGATOR Dante Minniti

ITEM	Total/ Good	Partial/ Regular	Insufficient/ Deficient	Internal use
Degree of adoption of suggestions from the last report *				
Accomplishment of objectives and goals of the reported program	X			
Quantity of the results reached regarding the objectives and goals	X			
Quality of reached outcomes related to proposal objectives and goals	X			
Degree of integration with other ongoing programs of the Center		X		
Diffusion of the results	X			

Comments: This research program has made much progress in recent years. The group is pursuing a variety of techniques, including radial velocity studies and transit time monitoring, to study exoplanets and brown dwarf stars. They have also been active in follow up studies that have investigated the properties of brown dwarfs and stars hosting planets. The HAT-South station in Chile, part of network of telescopes to monitor transit events, is now producing planet candidates. It is good that they will be working with the Stellar Populations program on the VVV survey, as both groups have much to gain from this survey. Overall the program seems to moving forward on many fronts. This has been a very active research program and one that has attracted a large number of graduate students.

PROGRAM'S NAME Supernovae and Dark Energy
PRINCIPAL INVESTIGATOR Mario Hamuy

ITEM	Total/ Good	Partial/ Regular	Insufficient/ Deficient	Internal use
Degree of adoption of suggestions from the last report *				
Accomplishment of objectives and goals of the reported program	X			
Quantity of the results reached regarding the objectives and goals	X			
Quality of reached outcomes related to proposal objectives and goals	X			
Degree of integration with other ongoing programs of the Center	X			
Diffusion of the results	X			

Comments: This is the newest and one of the smallest of the Center's research programs. I am pleased to see that the program has attracted a reasonable number of graduate students. The program is focused on the detection and characterization of local supernovae. The CHASE program using the PROMPT robotic telescope has yielded many new supernova detections this past year. The group has also made very important follow-up photometric and spectroscopic observations of these newly discovered supernovae and these results will be useful for improved calibration of supernovae for distance determination. The group is also modeling the physics of supernovae using hydrodynamic simulations. This program has been very productive and doing some fundamental science.

IV. CENTER EVALUATION

ITEM	Total/ Good	Partial/ Regular	Insufficient/ Deficient	Uso Interno
Degree of adoption of suggestions from the last report *	X			
Accomplishment of objectives and goals of the Center	X			
Quantity of reached outcomes related to proposal objectives and goals	X			
Quality of reached outcomes related to proposal objectives and goals	X			
Degree of integration between the programs of the Center		X		
Creation and reinforcement of international networks	X			
Outreach	X			
Diffusion of results	X			
Establishment and tasks of the Advisory Committee		X		

RECOMMENDATIONS (see following concepts)					
<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">X</div>	<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div>	<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div>	<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div>	<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div>	<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto; background-color: #e0ffff;"></div>
APPROVE	APPROVAL WITH SUGGESTIONS	ADDITIONAL INFO.	PENDING	REJECT	FONDECYT USE

04	21	11
----	----	----

Evaluation Date

Signature reviewer

EVALUATION CONCEPTS ANNUAL REPORT

1. **Approve:** The reviewer recommends to accept the report in its present form since he/she considers objectives and goals fully accomplished and all relevant issues covered by the report.
2. **Approval with suggestions or minor observations**
 - 2.1 **Minor observations:** The reviewer recommends the approval of the report despite the justified incompleteness of some aspects that does not constitute an obstacle for the continuity of the Center activities.
 - 2.2 **Suggestions:** The reviewer recommends minor changes in order to improve the future performance of the Center.
3. **Additional information:** The reviewer requires additional documentation or specific explanations to fully evaluate the report.
4. **Pending:** The reviewer makes significant observations to the report and conditions its approval to the accomplishment of specific demands.
5. **Reject:** The reviewer has strong objections to the contents of the report.

EVALUATION COMMENTS:

The FONDAP Centro de Astrofísica has been a success in addressing its original goals. As in past years, the Center has continued to expand the number of astronomy researchers, increase the visibility of Chilean astronomy, educate the next generation of astronomers, and provide excellent outreach programs to school children, teachers and the public. The Center completed another very successful and productive year. The Center continues to produce substantial and important publications in the world's leading astronomical journals. The 190 refereed publications this year is a significant accomplishment and has greatly exceeded the 132 publication from last year. The key projects have been an important part of this success and important in building collaborative science efforts between the three institutions that are part of the Center and with the international astronomical community.

Over the past 9 years the Center has played an important role in developing human resources in Chile. The Center has grown to include 35 researchers, including one new outstanding addition, thus surpassing earlier goals for the Center. Most impressive has been the increases in graduate student training. All three of the Chilean Center institutions now have active graduate programs with 61 current students, up significantly from last year. The annual report noted that most of these students have benefited from the Center for by enabling funding for observing trips or to attend international meeting. Also many of the students are directly involved in the Key Projects. International collaborations continue to expand and I am pleased to see that the Center sponsored 5 workshops, with two important workshops related to ALMA science and a third relating to supercomputing.

I am delighted to see that the Center has chosen a suite of new Key Projects for the coming decade. The four original key projects have been extremely successful in bringing together Chilean astronomers, in building collaborations with European and US astronomers and in making more effective use of the observing resources available in Chile. These new key projects all are well thought out and make good use of two new facilities in Chile, the VISTA telescope and ALMA. Two of the key projects are ESO large programs. These Key Projects will help to continue to build strong connections between the various research areas and Center members and also utilize many of the new facilities available in Chile.

With ALMA early science coming up soon, I am encouraged to see that the Center has created a Chile-ALMA committee and will put forward a proposal for a Chilean ALMA regional center. The Center has also organized two important workshops to discuss ALMA science. I think the plan to build ALMA collaborations with the international community is a good direction and meetings like that in Mexico (Massive Star Formation with ALMA) are a good start. It is also good to see that the Center is coordinating these activities with all Chilean Universities. I think ALMA provides enormous opportunities to nearly all of the research areas of the Center.

The Center has also been very active in outreach. The education of school children and their teachers is an important outreach activity and the Center has been very active in this regard. I think Project Carina is an interesting outreach project that will provides view of the sky to students and their parents. I tried over a number of days to access the Center's website, but was unable, so I cannot comment on its content. However, if it has not been done already, I urge that the website be maintained in both Spanish and English, the English version is important to advertise the Center's activities to the international astronomical community.

Communication is important and has been stressed in past reviews. As was the case last year, it is good to see that the Center supports regular weekly or bi-monthly meeting of the various research groups. It was unclear in the report whether there was an annual meeting of the Center attended by everyone, including students. The report shows an organization chart with a Graduate Studies Committee, however again, it was unclear whether this committee met.

Although the technology initiatives that were recommended by past reviewers of the Center are funded under CATA, it would have been useful to have a brief summary of these activities in this report. I found on the website for astronomy at the Universidad de Chile a summary of progress on the microwave lab. However, I could not find any information on the high performance computing initiative. Since researchers have been recruited in this field, I assume facilities exist for this activity. I think these technology initiatives are an important aspect of the Center and has potential for synergy with other sciences and in the development of computational infrastructure in Chile. Again an update of the progress in this area would be useful.

The International Advisory Committee did not visit the Center this past year, however instead they were evaluated by an international panel of experts. Since this evaluation seemed to be focused on the technology development, I am not certain whether it replaces the input they would have received from the advisory committee. I would recommend that they plan on annual meetings of the International Advisory Committee. It would have also been useful to have been provided with the report and recommendations of these experts, including the response of the Center.

I again strongly encourage more student participation in research whenever possible. Of the 190 refereed papers, only 31 had student participation. I agree with the comment in the report that some of these papers are written by postdocs, and these publications would unlikely have student authors. However 153 papers had participation by researchers, and still only 31 of these had student authors. It is very important to encourage student participation in research early in their graduate training and I hope one of the Center's goals in the future is to increase the graduate student participation in refereed publications. Another minor note regarding publication, the spreadsheet I received did not have the papers broken down by research area, which would be useful in future reports.

In summary, I am extremely pleased to see the advances the Center has made, not only in this past year, but since it was founded nine years ago. The Center has been responsive to comments and suggestions made by past reviewers. The Center has achieved all of the goals that it originally set out and more. The development of human resources over the past nine years has been stunning. Chile has access to many of the world's largest and most powerful astronomical facilities and the Center has been an important force in taking full advantage of this unique position. The Center has exceeded expectations, and has transformed Chilean astronomy. I hope that it can continue as a FONDAP Center for a second decade.

**ADDITIONAL INFORMATION REQUIRED FOR THE FULL EVALUATION
OF THE ANNUAL REPORT:**

If you require additional information or leave the evaluation pending, please indicate the documentation or explanations required to complete the evaluation. In case there are additional demands that the Center's director has to accomplish, these have to be explained so the director may take the necessary measures.

If you entirely reject the contents of the report (or significant portions of it) please indicate here the demands that should be posted to the Center' director.

RECOMMENDATIONS TO THE CENTER DIRECTOR:

(only if report is approved))



Comisión Nacional de Investigación
Científica y Tecnológica - CONICYT

ESTADO FINAL RESOLUCION DEL CONSEJO		FECHA		<div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div> <div style="margin-top: 5px;">1. APROBADO 2. PENDIENTE 3. RECHAZADO 4. A FISCALIA</div>
Observaciones: _____ _____		<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	

This is only for internal use of FONDAP

EVALUATION REPORT CENTERS FOR ADVANCED RESEARCH

I. PROJECT INFORMATION

CENTER'S NAME CENTRO DE ASTROFISICA

DIRECTOR GUIDO GARAY

II. EVALUATION PANEL

NAME	ORGANIZATION/ INSTITUTION	E-MAIL	SIGNATURE
REVIEWER 2			

III. PROGRAMS EVALUATION (please fill up as many forms as programs exist within the Center)

PROGRAM'S NAME **Area 1. Birth and evolution of structures in the universe**

PRINCIPAL INVESTIGATOR **L. Infante**

ITEM	Total/ Good	Partial/ Regular	Insufficient/ Deficient	Internal use
Degree of adoption of suggestions from the last report *				
Accomplishment of objectives and goals of the reported program	x			
Quantity of the results reached regarding the objectives and goals	x			
Quality of reached outcomes related to proposal objectives and goals	x			
Degree of integration with other ongoing programs of the Center		x		
Diffusion of the results	x			

Comments: This area is the most important part of the Center both for the number of researchers and of students. It is very productive in publications and it is engaged in many important international collaborations and projects. The field of surveys is especially strong and contributes much to the visibility of Chilean astronomy. There are a number of interesting new projects quoted. However, there is not much detail given to understand their importance and none is quoted in the list of new initiatives presented in the executive summary. None of the international workshops was organized directly in this field in 2010, but it was the main field addressed by the workshop "Supercomputing Techniques in Astrophysics" and a workshop will take place in June 2011 about "Multiwavelength Views of the ISM in High-Redshift Galaxies". There are lively regular internal meetings in this area. But curiously nothing about this area is quoted in Section 5 Networking.

PROGRAM'S NAME	Area 2 Stellar Populations in the Local Universe
PRINCIPAL INVESTIGATOR	D. Geisler

ITEM	Total/ Good	Partial/ Regular	Insufficient/ Deficient	Internal use
Degree of adoption of suggestions from the last report *		X		
Accomplishment of objectives and goals of the reported program	X			
Quantity of the results reached regarding the objectives and goals	X			
Quality of reached outcomes related to proposal objectives and goals	X			
Degree of integration with other ongoing programs of the Center		X		
Diffusion of the results	X			

Comments: This is a field very successful and very productive in publication number. The three fields of globular clusters, nearby galaxies and stellar populations in the Milky Way are strong. There are major new promising projects about the bulge of the Milky Way especially with the VVV survey, with good quoted networking within the Center. However, the writing of the report is not fully homogenous with the executive summary. It would be important to think of a strong link with GAIA and its ground follow-up. The absence of quotation of graduate students is probably related to a relative lack of them in this area which should be addressed.

PROGRAM'S NAME	Area 3 Distance Scale.
PRINCIPAL INVESTIGATOR	W. Gieren

ITEM	Total/ Good	Partial/ Regular	Insufficient/ Deficient	Internal use
Degree of adoption of suggestions from the last report *				
Accomplishment of objectives and goals of the reported program	X			
Quantity of the results reached regarding the objectives and goals	X			
Quality of reached outcomes related to proposal objectives and goals	X			
Degree of integration with other ongoing programs of the Center		X		
Diffusion of the results	X			

Comments: This is a very focused and well organized field, which allows this very active team to have a good international leadership. Interesting new projects are presented. However, it is not clear how much it is attractive for students.

PROGRAM'S NAME	Area 4: Star Formation
PRINCIPAL INVESTIGATOR	G. Garay

ITEM	Total/ Good	Partial/ Regular	Insufficient/ Deficient	Internal use
Degree of adoption of suggestions from the last report *	X			
Accomplishment of objectives and goals of the reported program	X			
Quantity of the results reached regarding the objectives and goals	X			
Quality of reached outcomes related to proposal objectives and goals	X			
Degree of integration with other ongoing programs of the Center		X		
Diffusion of the results	X			

Comments: This field has displayed a very good activity in the last year. It is nicely strengthening, well exploiting the boost of ALMA for Chilean astronomy. Several new projects were started in 2010, including an important one about proto-planetary disks. However, there is no emphasis on Herschel results which will be a major input for ALMA projects.

Two international workshops were organized in this area. There are regular internal meetings in this area.

PROGRAM'S NAME	Area 5: Extrasolar Planets and Brown Dwarfs
PRINCIPAL INVESTIGATOR	D. Minniti

ITEM	Total/ Good	Partial/ Regular	Insufficient/ Deficient	Internal use
Degree of adoption of suggestions from the last report *				
Accomplishment of objectives and goals of the reported program	X			
Quantity of the results reached regarding the objectives and goals	X			
Quality of reached outcomes related to proposal objectives and goals	X			
Degree of integration with other ongoing programs of the Center		X		
Diffusion of the results	X			

Comments: This still young field is very lively and productive. It appears especially attractive for students. There are many interesting ongoing and a few new projects. However, they might appear as the juxtaposition of many small projects. The Center would gain in adding (a) major ambitious new project(s) in this key field for the future. There are regular internal meetings in this area.

PROGRAM'S NAME	Area 6: Supernova and dark energy
PRINCIPAL INVESTIGATOR	M. Hamuy

ITEM	Total/ Good	Partial/ Regular	Insufficient/ Deficient	Internal use
Degree of adoption of suggestions from the last report *	x			
Accomplishment of objectives and goals of the reported program	x			
Quantity of the results reached regarding the objectives and goals	x			
Quality of reached outcomes related to proposal objectives and goals	x			
Degree of integration with other ongoing programs of the Center		x		
Diffusion of the results	x			

Comments: This is the last established area. It is very active and productive. The number of students has significantly increased, but only one PhD student is quoted in the xls table. This area develops a considerable activity in international projects with telescopes in Chili, for discovering supernovae and obtaining follow-up data about them. However, Chilean astronomy could be more ambitious in this key field of dark energy, especially for ground support to future major space missions such as EUCLID and WFIRST. There are regular internal meetings in this area.

IV. CENTER EVALUATION

ITEM	Total/ Good	Partial/ Regular	Insufficient/ Deficient	Uso Interno
Degree of adoption of suggestions from the last report *	X			
Accomplishment of objectives and goals of the Center	X			
Quantity of reached outcomes related to proposal objectives and goals	X			
Quality of reached outcomes related to proposal objectives and goals	X			
Degree of integration between the programs of the Center	X			
Creation and reinforcement of international networks	X			
Outreach	X			
Diffusion of results	X			
Establishment and tasks of the Advisory Committee				

RECOMMENDATIONS (see following concepts)					
<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">X</div>	<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div>	<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div>	<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div>	<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div>	<div style="background-color: #00FFFF; border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div>
APPROVE	APPROVAL WITH SUGGESTIONS	ADDITIONAL INFO.	PENDING	REJECT	FONDECYT USE

04

May

2011

Evaluation Date

Signature reviewer

EVALUATION CONCEPTS ANNUAL REPORT

1. **Approve:** The reviewer recommends to accept the report in its present form since he/she considers objectives and goals fully accomplished and all relevant issues covered by the report.
2. **Approval with suggestions or minor observations**
 - 2.1 **Minor observations:** The reviewer recommends the approval of the report despite the justified incompleteness of some aspects that does not constitute an obstacle for the continuity of the Center activities.
 - 2.2 **Suggestions:** The reviewer recommends minor changes in order to improve the future performance of the Center.
3. **Additional information:** The reviewer requires additional documentation or specific explanations to fully evaluate the report.
4. **Pending:** The reviewer makes significant observations to the report and conditions its approval to the accomplishment of specific demands.
5. **Reject:** The reviewer has strong objections to the contents of the report.

EVALUATION COMMENTS:

The Center for Astrophysics has continued and extended its outstanding activity in 2010, with high level activity and new projects in the six major areas significant increase of the number of publications, of graduate students and of international visitors, hiring of four new members, organization of five international workshops, good level of internal networking supported by regular weekly or bi-monthly meetings in different areas of research.

Detailed comments are provided above about the evaluation of the excellent activity and results in each of the six programs/areas of research.

A significant increase of activity, with major new projects is specially reported around surveys of the Milky Way Bulge for stellar populations and variable stars, especially with the VVV survey, and ALMA projects. The Center is supporting a good Chilean organization effort for the use of ALMA. However, none of the four scientists hired by the Center this year is working in an area strongly related to ALMA.

The level of international publications (190 in 2010) is impressive. It reflects well the outstanding level of international activity of the members of the Center.

The support through the Center to PhD student fellowships seems rightly high and increasing. It could justify that the Center reports be a little more detailed about PhD students. The xls table is detailed and useful. It completes the missing information in the report about students in areas 2 and 3 and confirms that their number is anomalously low in area 3 (only one student). However, the years quoted in the xls table for the years when the PhD started and is expected to be completed, cannot be the actual ones for many students. Giving somewhere actual years could help, e.g., to address the following questions: 1) Why only five students have obtained their PhD in 2010 for a total number of 39? Of course this should be mostly explained by the very strong increase of the number of students in the last years. But one would like to be sure that the PhD duration remains reasonable, the fellowship support is adequate and there is not a significant fraction of dropouts among PhD students. 2) The number of publications implying graduate students has increased. However, it remains less than one publication per student in the year, so that a vigorous effort is still needed to improve this anomalous situation. Of course this should also reflect the very strong increase of the number of students in the last years, and one should try to add to this count the number of papers published just after the PhD completion when the student is no longer in the Center, but the paper is still quoting the student affiliation to an institute of the Center.

**ADDITIONAL INFORMATION REQUIRED FOR THE FULL EVALUATION
OF THE ANNUAL REPORT:**

If you require additional information or leave the evaluation pending, please indicate the documentation or explanations required to complete the evaluation. In case there are additional demands that the Center's director has to accomplish, these have to be explained so the director may take the necessary measures.

If you entirely reject the contents of the report (or significant portions of it) please indicate here the demands that should be posted to the Center' director.

RECOMMENDATIONS TO THE CENTER DIRECTOR:

(only if report is approved))

With my congratulations for the bright success of the Center, and in addition to the relatively minor recommendations that I have made above about specific points, I would just like, in the context of this last year of its operation, to recommend to carefully prepare the application for its continuation for a second decade or so. I strongly recommend such a continuation to the FONDAP Program Director, because of the success of the Center and its crucial role in supporting an outstanding Chilean astronomical activity.

I would thus recommend to continue the Center activity and its projects on building on its impressive success, but taking the opportunity not just to extend the present situation without significant updates about scientific programs and projects, possible involvement of other Chilean astronomical groups, and membership. E.g., programs based on ESO or other large projects and on exoplanets, as well as ALMA could be a bit enhanced.