REM:

CHILEAN APEX TELESCOPE TAC

Prop. #:

Comisión Nacional de Investigación Científica y Tecnológica - CONICYT

Proposal for observations

Semester 2019-B

Submit files at `https://auth.conicyt.cl/`

Category: Radio

1. Title

Proposal for Observing Time in APEX by a Member of the Chilean Astronomical Community.

2. Abstract

Provide a concise summary of your proposal. You can use this form to apply for time on any of the APEX instruments.

Each proposal should contain a specific scientific project. If you have more than one project, then you should submit one separate proposal for each.

IMPORTANT: Students (S) must attach the support letter from their supervisor. Visiting researchers (V) must attach the letter from their host Chilean institution. If you are requesting time for a Private Instrument, an approval letter from the PI of such instrument should be attached. For more detail see numeral IV (Points 4.2, 4.3, 4.4) from the Bases.

THE SUBMITTED PDF FILE MUST BE IN LETTER FORMAT. FILES SUBMITTED IN A4 OR ANY OTHER FORMATS WILL NOT BE ACCEPTED

3. Principal investigator **Status (A,S,V):** S

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4. Co-investigators (names and institutions)

A. Mariscal (Univ. San Clemente, Chile)
R. M. Solares (Univ. D. Marcoleta, Chile)
D. Torres (Univ. San Camilo, Chile
M. Rodriguez (Til-Til, Chile)
J. M. Fernández (Catedral de Santiago, Chile)
◁ J. de la Barrera (Universidad de Valdivia, Chile)
F. Madero (Academia de Ciencias, Chile)

5a. Number of hours requested on the APEX telescope XXX

5b. Instrument(s) requested and hours (in each one)

Facility Instruments

		B5	B7	B9		
LABOCA: X	**SEPIA:**	X	X	X	**nFLASH:** X	

Private Instruments

ArTeMiS: X	
OTHER: X	

6a. Preferred months

first choice: July second choice: Sep/Oct

6b. Other scheduling constraints

7. Past and future of this project

i) Time already awarded to this project:

ii) Time required to complete this project:

8. Description of the programme (1 page of text + up to 2 pages for references, tables and figures.)

A) Scientific rationale Describe the scientific context of the research that you intend to carry out using APEX observing time. Make sure to provide a succinct, up-to-date review of the relevant literature, and to discuss the broader scientific implications of your proposed science.

B) Scientific aim Explain what exactly your team proposes to accomplish with the requested observations. Describe the reduction and analysis tools that you will use, and the scientific return expected.

References

E., Juarez, B., Mackenna, V., de Valdivia, P., & Montt, M. 2050, A&A, 1112, 3836

Montt, M., Juarez, B., P., de Valdivia, P., & Mackenna, V. 2049, A&A, 1111, 1334

Juarez, B., Montt, M., P., de Valdivia, P., & Mackenna, V. 2048, in Stellar Populations in National Flags, ASP Conf. Ser. 9532, ed. J. San Martín, S. Bolivar, & P. de Orleans-Bragança (La Paz: Alianza Editorial), 65

Figure 1: Relatively noisy spectra of an extragalactic globular cluster.

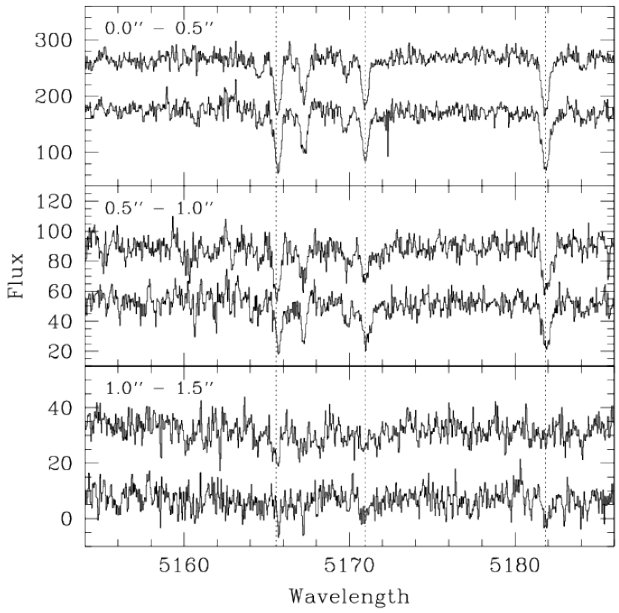


Figure 2: The same spectrum as before, but now rotated by 90°.

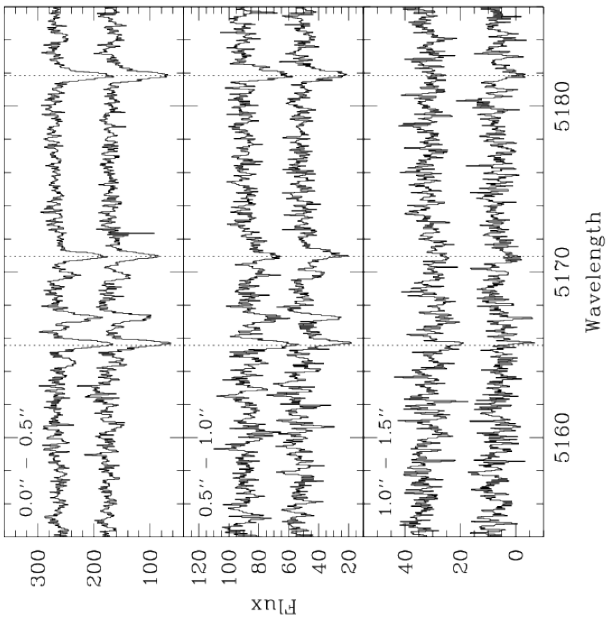


Figure 3: An enlarged, further rotated version of the previous figure.

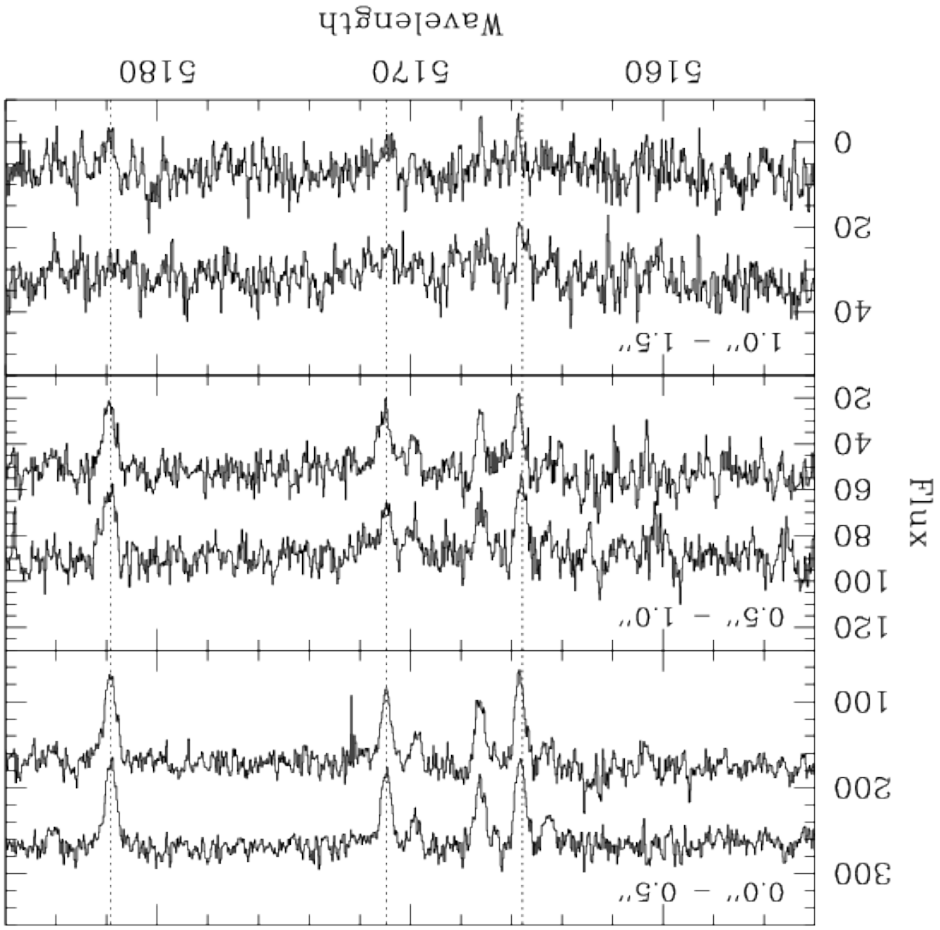


Table 1: Stars in National Flags

Country	N_{stars} (units)	Star type	N_{rays} (units)
	American Continent		
Argentina	$+1$	Sun of May	$+32$
Brazil	$+27$	Pentagon	$+5$
Chile	$+1$	Pentagon	$+5$
Uruguay	$+1$	Sun of May	$+16$
Venezuela	$+8$	Pentagon	$+5$
USA	$+50$	Pentagon	$+5$
	Other Continents		
Australia	$+6$	6 Heptagons + 1 Pentagon	$+7$, $+5$
Bangladesh	$+1$	Circle	$+0$
Bosnia and Herzegovina	$+7\frac{2}{2}$	Pentagon	$+5$
Cameroon	$+1$	Pentagon	$+5$
China	$+5$	Pentagon	$+5$
Iraq	$+3$	Pentagon	$+5$
Israel	$+1$	Star of David	$+6$
Marshall Islands	$+1$	Multi-rayed	$+24$
Namibia	$+1$	Circle + crown	$+12$
New Zealand	$+4$	Pentagon	$+5$
Nepal	$+1\frac{1}{2}$	Rayed circle	$+12$
Niger	$+1$	Circle	$+0$
Pakistan	$+1$	Pentagon	$+5$

9. Observational strategy and justification of requested time (please take into account overheads).

To estimate your exposure times, you are encouraged to check the Observing Time Calculator tool for the instrument(s) you are going to use that are available at the observatory web page
http://www.apex-telescope.org/instruments
If an OTC is not available for your telescope/instrument combination, please consult directly with the team responsible for its operation.

If you intend to do an On-The-Fly mapping, you can use the web page:
http://www.apex-telescope.org/heterodyne/calculator/OTFSimulator/
to design the OTF maps.

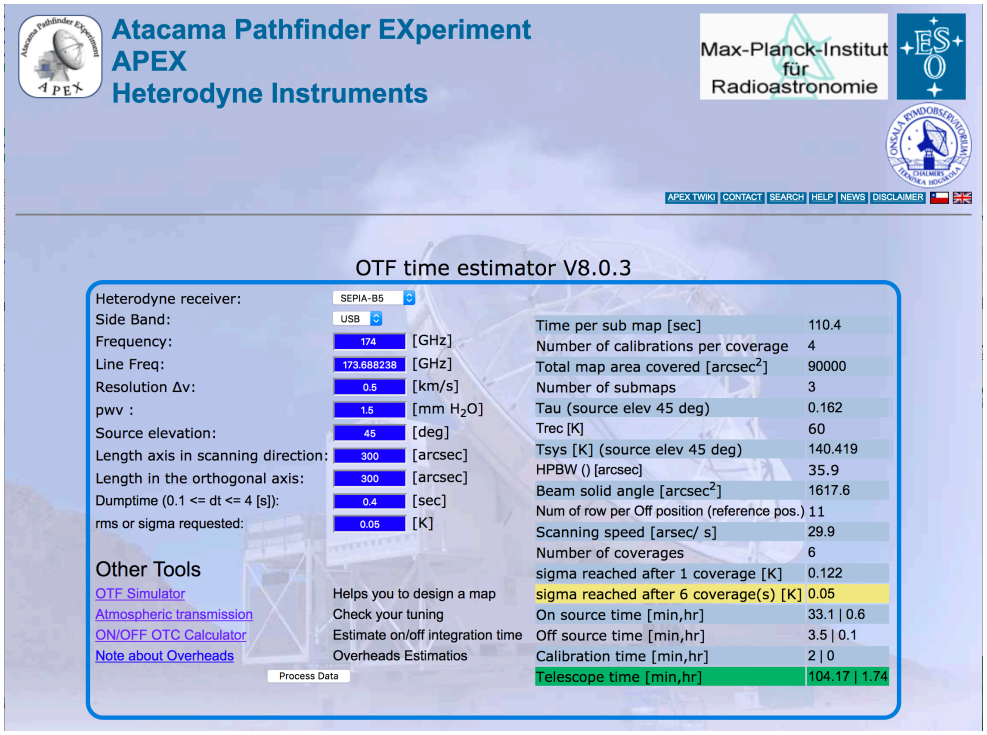
PLEASE MAKE SURE ALL THE TIMES REQUESTED ARE CONSISTENT THROUGHOUT THE PROPOSAL: TOTAL NUMBER OF HOURS (BOX 5A), HOURS PER INSTRUMENT (BOXES ON 5B) AND THE JUSTIFICATION FOR THE REQUESTED TIME (THIS BOX 9)

Please put in page 3a (and 3b if necessary) the SCREENSHOT(S) OF THE OBSERVING TIME CALCULATOR(S), with the values you used to calculate the requested observing time. One screenshot for each instrument you are proposing to use.

10. List of targets (note that the absence of a proper object list and information will weaken your proposal).

Name	α	δ	Epoch	Mag.	Additional Information
HD 177482	21 08 46.85	-88 57 23.40	J2000	V=5.42	Closest star to the south celestial pole

Figure 4: Screenshot of SEPIA B5 OTF time calculator.



11a. APEX observing time in the last 2 years

Proposal code	Proposal title
CHILE-000A-0000	Testing Gravitational Repulsion in an Expanding Universe
CHILE-000B-0000	Observational Evidence for a Spinning Solar System

Dates	Telescope	Awarded time	Loss (%)	Reason(s)
13 Mar–10 Apr 1630	APEX2A	5 n	25	Cloudy skies
01–05 Oct 2006	LABOCA	5 n	10	High humidity
25 Dec 2100	APEX2A	8 h	0	

11b. Brief description of the status of this (these) project(s), including publications based on these observations.

Several papers have already been published on the basis of the acquired data. We have somehow been unable to prove that gravity is a repulsive force, but will keep trying. The Solar System does appear to rotate though, and **magnetic fields are really important**. Some of the papers published include the following:

Juarez, B., Fernández, J. M., & Torres, D., et al. 2049, A&A, 1111, 1334

Diaz, P., & Juarez, B. 2050, ApJ, 7000, 567

11c. Other publications in the course of the past 3 years on the topic of this proposal (please include article titles).

Rodriguez, S., Juarez, B., Madero, F., et al. 2006, A&A, 1111, 1334: *Study on the Independence Movements of Extraterrestrial Colonies*

Avila, M., Juarez, B., & Madero, F. 2005, ApJ, 6854, 2365: *Will the Stars in the Milky Way Arrive Somewhere as a Consequence of Their Rotation?*

12a. If this proposal is part of a MSc or PhD thesis project, write here the name of the student, the thesis title, and briefly describe the importance of the requested observations to achieve the goals of the thesis.

G. Buendía (PhD, BIT), *The Matrix is you: Solar magnetic reconnection inside the matrix* The data to be acquired with this proposal will form the core of the student's thesis.

12b. Describe how the observations complement data from other facilities. For each of the latter, indicate the nature of the observations (yours or those of others), and describe the importance of the observations proposed here in the context of the entire program. If similar data exist in the APEX archive, justify the need for the observations proposed here.

We have also submmitted a proposal to observe this sources with the Dark Side of the Moon telescope.