

INAF – TIME ALLOCATION COMMITTEE

Application for observing time

Category: D

Period AOT39 (April 2019 – September 2019)

Submit using: www.tng.iac.es/submit.html

1. Title Characterization of short-period overcontact W UMa binary star systems.														
2. Abstract Determination of the main physical characteristics of a sample of short-period W UMa binary systems by comparison of standard multicolor light curves with synthetic light curves.														
3a. Number of requested hours per telescope and instrument														
TNG					REM									
DOLORES	DOLOR.+MOS	NICS	HARPS-N	GIANO-B	ROSS	REMIR								
					12	12								
3b. Observing modes <table style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="padding-right: 10px;">TNG:</td> <td style="border: 1px solid black; padding: 2px 10px;">☐ Visitor</td> <td style="border: 1px solid black; padding: 2px 10px;">☐ Service</td> <td style="border: 1px solid black; padding: 2px 10px;">☐ ToO</td> </tr> <tr> <td>REM:</td> <td style="border: 1px solid black; padding: 2px 10px;">☐ Rapid Response</td> <td style="border: 1px solid black; padding: 2px 10px;">☒ Queuing</td> <td style="border: 1px solid black; padding: 2px 10px;">☐ ToO</td> </tr> </table>							TNG:	☐ Visitor	☐ Service	☐ ToO	REM:	☐ Rapid Response	☒ Queuing	☐ ToO
TNG:	☐ Visitor	☐ Service	☐ ToO											
REM:	☐ Rapid Response	☒ Queuing	☐ ToO											
4a. Preferred months first choice: Jun second choice: Jul 4b. Other scheduling constraints (use also box 14)				5a. Past and future of the project a) Hours already awarded to the project: 0 b) Hours foreseen to complete the project: 108 (not including this request)										
6. Principal investigator Name Daniele Gardiol Institute INAF-Osservatorio Astrofisico di Torino Address via Osservatorio 20, I-10025 Pino Torinese (TO) e-mail daniele.gardiol@inaf.it Phone +39 011 8101986				7. Co-investigators (name and institution) G. Pettiti - INAF-Osservatorio Astrofisico di Torino D. Barghini - INAF-Osservatorio Astrofisico di Torino										

8. Status of the project

Telescope	Instrument	Date	Hours	Notes
Cassini	BFOSC	2016-12-07	8	
OAVdA		2017-01-23	8	
OAVdA		2017-03-14	2	

Description

The purpose of the program is to determine the main physical characteristics of overcontact W UMa binary star systems by comparison of multicolor light curves with synthetic light curves.

Publications

Pettiti G., Gardiol D., Benna C., Carbognani A., *Physical parameters of Eclipsing Binary V683 Cas*, in preparation

9a. If this proposal is a part of a PhD thesis, write here the name of the student, the thesis title and briefly describe the relevance of these observations for the thesis goals.

9b. Is this, or a similar application submitted to other time allocation committees (e.g. ESO, TNG-CAT, ITP)? If yes, please specify which and explain if and why the proposals should be considered complementary.

10. Description of the programme (max. 3 pages, including references, tables, and figures.)

A) *Scientific rationale* The period distribution of the overcontact W UMa binaries shows a peak at about 0.27 days and a short-period limit at about 0.2 days (Rucinski, 2007). No satisfactory explanation for the short-period limit is yet known, and there is interest in the discovery and characterization of systems near the limit.

B) *Scientific aim* To expand the sample of W UMa binary star systems with well defined physical characteristics to support short-period systems modeling.

References:

Rucinski S.M., *The short-period end of the contact binary period distribution based on the All-Sky Automated Survey*, Monthly Notices of the Royal Astronomical Society, Vol. 382, Issue 1, pp.393-396, 2007

11. List of targets (note that the absence of a proper object list and information may weaken the proposal)

Name	α	δ	Epoch	Mag.	Time	Additional Information
1SWASP J201808.68- 231443.0	20 18 08.68	-23 14 43.0	J2000	V14.5	21600s	
1SWASP J212813.35- 520029.1	21 28 13.35	-52 00 29.1	J2000	V15.7	21600s	

12. Observational strategy and justification of requested time, including overheads.

Six (6) hours for each system are required to complete one binary system cycle. Time for acquisition of auxiliary photometric observations, e.g. dark frame, flat field and standard fields is excluded. It is assumed that REM instrumentation color terms, i.e. coefficients for transformation of instrumental magnitudes to standard magnitudes are known and available.

13. Requested instrument(s) setup

Id	Instrument	Binning	Filter(s)	Slit	Grism	Time	Additional Information
REM	1x1		g,r,i,z,IR			12	

14a. Moonlight constraints

Max. # of days from new moon

14b. Scheduling constraints, special requirements and other remarks
(please include justification of constraints in 14a)

A complete 6 hours cycle of each binary system has to be observed. Regarding point 14a the requirement is to allow for a precise photometry.

15. Observational background of the applicants

Name of the observer(s) at TNG:

Experience of the observer(s) with the requested TNG instrument(s)

Experience of the observer(s) with other telescopes/instruments