

# THE PORTUGUESE NEWSLETTER OF ASTRONOMY

## *BOLETIM PORTUGUÊS DE ASTRONOMIA*

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# 1 ABSTRACTS OF RECENTLY ACCEPTED PAPERS

## *Resumos de artigos aceites recentemente*

### Edge-on disk around the T Tauri star [MR81] Halpha 17 NE in CrA

Neuhäuser, R.<sup>1</sup>; Krämer, S.<sup>1</sup>; Mugrauer, M.<sup>1</sup>; Köhler, R.<sup>2,3</sup>; Schmidt, T.O.B.<sup>1</sup>; Ammler-von Eiff, M.<sup>4</sup>; Alves, J.<sup>5</sup>; Fiedler, S.<sup>1</sup>; Vogt, N.<sup>6,7</sup>;

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<sup>2</sup> ZAH Landessternwarte, Königstuhl, 69117 Heidelberg, Germany;

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<sup>7</sup> Instituto de Astronomía, Universidad Catolica del Norte, Avda. Angamos 0610, Antofagasta, Chile;

Using the speckle camera SHARP at the 3.5m ESO NTT, Köhler and collaborators found an object 3.5 mag fainter in K only 1.3" north-east of the T Tauri star [MR81] Ha 17 in the Corona Australis (CrA) star-forming region, which could be either a brown dwarf or a T Tauri star with an edge-on disk. We attempt to study this faint object in detail. We acquired deep VLT NACO near-infrared images at three epochs to determine, whether [MR81] Ha 17 and the nearby faint object are co-moving and to measure the infrared colors of both objects. We obtained optical and infrared spectra of both objects with the VLT using FORS and ISAAC, respectively, to determine spectral types and temperatures as well as ages and masses. The T Tauri star [MR81] Ha 17 and the faint nearby object have a projected separation of 1369.58 mas, i.e. 178 AU at 130 pc. They share the same proper motion ( $\approx 5$  sigma), so that they most certainly form a bound binary pair. The apparently fainter component [MR81] Ha 17 NE has a spectral type of M2e, while the apparently brighter component [MR81] Ha 17 SW, the previously known T Tauri star, has a spectral type of M4-5e. We can identify a nearly edge-on disk around [MR81] Ha 17 NE by visual inspection, which has a diameter of at least 30 to 50 AU. We are able to detect strong emission lines in [MR81] Ha 17 NE, which are almost certainly due to ongoing accretion. The NE object is detectable only by means of its scattered light. If both objects are coeval (2-3 Myr) and located at the same distance ( $\approx 130$  pc as CrA), then the apparently fainter [MR81] Ha 17 NE is more massive (primary) component with a nearly edge-on disk and the apparently brighter component [MR81] Ha 17 SW is less massive (companion). Both are low-mass T Tauri stars with masses of 0.5 and  $0.23 \pm 0.05$  solar masses, respectively.

Accepted by: A&A

<http://arxiv.org/pdf/0902.1463v1>

### Stability conditions for a noncommutative scalar field coupled to gravity

Bertolami, O.<sup>1</sup>; Zarro, C. A. D.<sup>1,2</sup>;

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<sup>2</sup> Instituto de Plasmas e Fusão Nuclear, Instituto Superior Técnico, Lisboa, Portugal;

We consider a noncommutative scalar field with a covariantly constant noncommutative parameter in a curved space-time background. For a potential as a noncommutative polynomial it is shown that the stability conditions are unaffected by the noncommutativity, a result that is valid irrespective whether space-time has horizons or not.

Accepted by: Physics Letters B, Volume 673, Issue 1, p. 83-89

[http://esoads.eso.org/cgi-bin/nph-data\\_query?bibcode=2009PhLB..673...83B&link\\_type=PREPRINT&db\\_key=PHY](http://esoads.eso.org/cgi-bin/nph-data_query?bibcode=2009PhLB..673...83B&link_type=PREPRINT&db_key=PHY)

## Thin accretion disks in stationary axisymmetric wormhole spacetimes

Harko, T.<sup>1</sup>; Kovács, Zoltán<sup>2,3</sup>; Lobo, F. S. N.<sup>4</sup>;

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<sup>2</sup> Max-Planck-Institut für Radioastronomie, Auf dem Hügel 69, 53121 Bonn, Germany;

<sup>3</sup> Department of Experimental Physics, University of Szeged, Dóm Tér 9, Szeged 6720, Hungary;

<sup>4</sup> Centro de Astronomia e Astrofísica da Universidade de Lisboa, Campo Grande, Ed. C8 1749-016 Lisboa, Portugal;

In this paper, we study the physical properties and the equilibrium thermal radiation emission characteristics of matter forming thin accretion disks in stationary axially symmetric wormhole spacetimes. The thin disk models are constructed by taking different values of the wormhole's angular velocity, and the time averaged energy flux, the disk temperature, and the emission spectra of the accretion disks are obtained. Comparing the mass accretion in a rotating wormhole geometry with the one of a Kerr black hole, we verify that the intensity of the flux emerging from the disk surface is greater for wormholes than for rotating black holes with the same geometrical mass and accretion rate. We also present the conversion efficiency of the accreting mass into radiation, and show that the rotating wormholes provide a much more efficient engine for the transformation of the accreting mass into radiation than the Kerr black holes. Therefore specific signatures appear in the electromagnetic spectrum of thin disks around rotating wormholes, thus leading to the possibility of distinguishing wormhole geometries by using astrophysical observations of the emission spectra from accretion disks.

Accepted by: Physical Review D, vol. 79, Issue 6, id. 064001

[http://esoads.eso.org/cgi-bin/nph-data\\_query?bibcode=2009PhRvD..79f4001H&link\\_type=PREPRINT&db\\_key=PHY](http://esoads.eso.org/cgi-bin/nph-data_query?bibcode=2009PhRvD..79f4001H&link_type=PREPRINT&db_key=PHY)

## Chemical abundances of 451 stars from the HARPS GTO planet search program: Thin disc, thick disc, and planets

Neves, V.<sup>1,2</sup>; Santos, N. C.<sup>1,3</sup>; Sousa, S. G.<sup>1,4</sup>; Correia, A. C. M.<sup>2</sup>; Israelian, G.<sup>5</sup>;

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<sup>2</sup> Departamento de Física, Universidade de Aveiro, Campus de Santiago 3810-193 Aveiro, Portugal ;

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<sup>5</sup> Instituto de Astrofísica de Canarias, 38200 La Laguna, Tenerife, Spain ;

We present a uniform study of the chemical abundances of 12 elements (Si, Ca, Sc, Ti, V, Cr, Mn, Co, Ni, Na, Mg, and Al) derived from the spectra of 451 stars observed as part of one of the HARPS GTO planet search programs. Sixty eight of these are planet-bearing stars. The main goals of our work are: i) the investigation of possible differences between the abundances of stars with and without planets; ii) the study of the possible differences in the abundances of stars in the thin and the thick disc. We confirm that there is a systematically higher metallicity in planet host stars, when compared to non planet-hosts, common to all studied species. We also found that there is no difference in the galactic chemical evolution trends of the stars with and without planets. Stars that harbour planetary companions simply appear to be in the high metallicity tail of the distribution. We also confirm that Neptunian and super-Earth class planets may be easier to find at lower metallicities. A statistically significant abundance difference between stars of the thin and the thick disc was found for  $[\text{Fe}/\text{H}] < 0$ . However, the populations from the thick and the thin disc cannot be clearly separated.

Accepted by: Astronomy & Astrophysics, in press

<http://de.arxiv.org/abs/0902.3374>

## 2 NEW JOB AND SCHOLARSHIP OFFERS

*Anúncios recentes de empregos e bolsas*

### LEAP project Postdocs

Paula Teixeira ; E-mail contact: pteixeir@eso.org

The first five positions fo Michael Kramer's ERC funded LEAP project are now open for application. The LEAP project is a 5 year project which has as its ultimate aim to use pulsars to detect gravitational waves directly. The project involves aspects of high precision pulsar timing and VLBI techniques and thus we are looking for excellent applicants with a background in either pulsar astronomy or inteferometric radio astronomy or both. There are three postdoc positions with a duration of 3 years, one position at each of Effelsberg/Bonn, Jodrell/Manchester and WSRT/ASTRON to support the data acquisition, implementation of new techniques and scientific exploitation of the data. There is one 5 year postdoc position for theoretical and interpreation work which will be based in Bonn. There is a more senior fixed term 5 year position for the overall supervision and project implementation which will be based in Manchester.

For more information please see

<http://www.manchester.ac.uk/aboutus/jobs/research/vacancy/index.htm?ref=151330>

and/or contact Michael Kramer (Michael.Kramer@manchester.ac.uk) or Ben Stappers (Ben.Stappers@manchester.ac.uk)

I'd also like to take this opportunity to remind you of the Lectureship at the University of Manchester.

<http://www.manchester.ac.uk/aboutus/jobs/academic/vacancy/index.htm?ref=150367>

Michael Kramer and Ben Stappers

## 3 MEETINGS AND CONFERENCES

*Reuniões e encontros*

### ESA-CONSTELLATION workshop on brown dwarf formation: first announcement

Catarina Alves de Oliveira ; E-mail contact: coliveir@eso.org

\*\*\*\*\*First Announcement\*\*\*\*\*

"Recipes for making brownies: theory vs. observations"

A joint ESA-CONSTELLATION workshop on the formation of brown dwarfs

\*\*\*\*\*

ESA-ESTEC, Noordwijk, The Netherlands

September 9-11, 2009

<http://www.rssd.esa.int/BD2009>

The origin of brown dwarfs (BDs) is an important component of the theory of star formation. Recent ground based and satellite observations are revealing an increasing number of BDs; however, their origin remains somewhat mysterious as their mass is 2 orders of magnitude below the average Jeans mass in star-forming clouds. Explaining why they are so common thus requires detailed understanding of the fragmentation processes during star formation, as well as exploring other formation scenarios.

This workshop will focus on recent theoretical and observational progresses in the field of BD formation as well as

explore current and future perspectives. Our purpose is to bring together the leading experts working in this field, foster new collaborations and, in particular, promote extended interactions among young PhD/post-doc researchers.

We invite interested colleagues to submit abstracts for presentations or posters. The deadline for abstract submission is April 30th 2009.

Due to space constraints at the venue, the total number of participants will be limited to about 50 including invited speakers, and, unfortunately, we cannot at this time guarantee attendance for all submitted abstracts. All persons who have submitted an abstract will receive an e-mail confirming that they are invited to attend within 10 days after abstract submission closes.

We have limited funding available to support participants, in particular PhD students and young postdocs. If you need support, please contact us at your earliest convenience by mail (Jakob Walcher, jwalcher@rssi.esa.int) with a short motivation and an estimate of the amount requested. Funding decisions will be made within 10 days after abstract submission closes.

If you have any further questions, please contact Loredana Spezzi (lspezzi@rssi.esa.int).

TOPICS: Brown dwarf formation scenarios Observed properties of brown dwarfs Proto-brown dwarfs, circumstellar disks, and accretion processes Future observing facilities

A preliminary programme is available at the web page of the conference: <http://www.rssi.esa.int/BD2009>

INVITED SPEAKERS: P. Andre, M. Bate, I. Bonnell, J. Bouvier, P. Clark, F. Comeron, M. Fridlund, C. Helling, P. Hennebelle, V. Joergens, R. Jayawardhana, K. Luhman, M. McCaughrean, A. Natta, P. Padoan, F. Palla, L. Testi, A. Whitworth, M.R. Zapatero Osorio

SCIENTIFIC ORGANIZING COMMITTEE: Loredana Spezzi (chair, ESTEC) Bruno Merin (ESAC) Dimitris Stamatellos (Cardiff University) Vera Konyves (Paris/Saclay) Catarina Alves de Oliveira (LAOG, Grenoble)

## **BINARIES-KEY TO COMPREHENSION TO THE UNIVERSE**

**Paula Teixeira** ; E-mail contact: [pteixeir@eso.org](mailto:pteixeir@eso.org)

Dear colleague,

let me inform you about the conference “Binaries – Key to Comprehension of the Universe” which will be held in Brno, Czech Republic from 8th to 12th June, 2009. More information you can find on our webpage

<http://astro.physics.muni.cz/binkey>.

We hope we will meet with you in the late Spring in Brno.

On behalf of SOC Andrej Prsa and LOC Miloslav Zejda

## **The Unity of the Universe**

**Paula Teixeira** ; E-mail contact: [pteixeir@eso.org](mailto:pteixeir@eso.org)

29th June - 1st July 2009 at the University of Portsmouth

REGISTRATION is now OPEN online at <http://www.icg.port.ac.uk/sciama09>

Topics covered include:

- the very early universe and the cosmic microwave background;
- large-scale structure and dark energy;
- galaxy formation and evolution.

Invited speakers include John Barrow, Bruce Bassett, Carlton Baugh, James Binney, Alessandra Buonanno, Andrea

Cimatti, George Efstathiou, George Ellis, Carlos Frenk, Josh Frieman, Nick Kaiser, Renata Kallosh, Guinevere Kauffmann, Andrei Linde, Martin Rees, Alvio Renzini, Paolo Salucci, Misao Sasaki, Joseph Silk, Simon White.

There will also be the opportunity for contributed talks and posters.

The official opening of the Dennis Sciama Building, the new home of the Institute of Cosmology and Gravitation, will take place on the evening of Monday 29th June, followed by a public lecture by Prof Sir Martin Rees, Astronomer Royal.

The conference dinner will take place on the evening of Tuesday 30th June on the gun deck of HMS Warrior in Portsmouth's Historic Dockyard: <http://www.historicdockyard.co.uk/dockyard>.

Key dates:

- deadline for submission of abstracts: 15th March 2009
- early registration deadline (at reduced rate): 15th April 2009

On behalf of the local organising committee: David Bacon, Marco Bruni, Claudia Maraston, Will Percival, Daniel Thomas and David Wands (chair).

## **Towards Other Earths: perspectives and limitations in the ELT era**

**Paula Teixeira** ; E-mail contact: [pteixeir@eso.org](mailto:pteixeir@eso.org)

### SECOND ANNOUNCEMENT

(February 2009)

This announcement provides preliminary information about the scientific program, logistic information, a list of important dates, information on how to register and submit your abstracts, and a first description of the social program. Additional information can be found at the web page of the meeting.

### SCIENTIFIC PROGRAM

The meeting will have a duration of 5 days, starting on Monday morning and finishing on Friday afternoon.

The scientific rationale can be found in the web page of the conference, where a preliminary list of confirmed invited speakers and reviewers is already available.

We intend to have a limited number of comprehensive reviews (30+5 minutes), invited talks (20+5 minutes), and a large number of shorter talks (15+5 minutes each). Coffee and lunch breaks will be aimed for poster viewing and discussion.

In addition to invited talks, contributed papers (oral or poster) can be presented. The SOC will select a limited number of contributions for oral presentation on the basis of the submitted abstracts. More details will appear soon.

### CONFERENCE VENUE AND TRAVELING INFORMATION

The conference will take place in the town of Porto, Portugal. The venue will be the public library "Biblioteca Municipal Almeida Garrett", located at the garden of "Palácio de Cristal". The conference room has about 200 seats. WiFi internet connection will be available. More details and maps are available at the conference web page (<http://www.astro.up.pt/toe2009>).

Porto (Oporto in English), is the second largest town in Portugal. It is located in the estuary of the Douro river, facing the Atlantic ocean. The city is about 300 Km north of the Portuguese capital (Lisbon), and is renowned for its famous Port (Porto) Wine. The wine itself is produced in the Douro valley, in what was the first wine demarcated region of the world. The beauty of this beautiful area, with landscapes carved by men and nature in an unique way, is today UNESCO's world "World Heritage Patrimony Sight". Porto's historical centre itself was classified by the UNESCO as "World Cultural Heritage" in December 1996.

Details about traveling to Porto can be found at the conference web page.

## IMPORTANT DATES

\* February 2009: Registration opens  
July 17th, 2009: Abstract submission deadline  
August 31th, 2009: Registration deadline  
October 19th, 2009: Welcome to Porto

## HOTEL INFORMATION

A list of nearby hotels is available at the web page of the conference. They are all within walking distance from the conference venue.

Hotel reservations have to be done directly with each hotel. In some cases lower fares are available to participants. When making your reservation don't forget to mention that you are attending the "Towards Other Earths" conference, organized by the "Centro de Astrofísica da Universidade do Porto".

We encourage participants to book their hotel well in advance.

## REGISTRATION

Registration is now open.

Participants should register using the appropriate web form available at the conference web page. The registration fee is fixed at 150 Euros, and will include participation in the social program, the conference dinner, and the coffee breaks.

The registration fee can be payed by international bank transfer (see details on the web page). Please clearly identify you name when doing your transfer, and notify the LOC by e-mail (toe2009@astro.up.pt). In your e-mail, if possible please mention the reference code of the transfer (or any clear identifier), or send us a file with the bank's receipt.

If you find any problem to do a bank transfer don't hesitate to contact the LOC.

Due to logistic reasons there is a limit to the number of participants. Please note that late registration may not be possible.

## ABSTRACT SUBMISSION

Please send us the abstract of your contribution using the appropriate web form. Those who wish to present a paper (either oral or poster) are kindly requested to send us an abstract before July 17th. Review/Invited speakers are also kindly requested to send us the abstract of their talk for inclusion in the Abstract Booklet.

## SOCIAL PROGRAM

A welcome cocktail will be offered on Sunday 18th at the Centro de Astrofísica da Universidade do Porto (CAUP).

The conference dinner will likely take place on Wednesday 21st. When registering, please indicate whether you think will be able or not to attend the dinner, and how many accompanying persons you will take. The price for accompanying people is aprox. 50 Euro.

More details on the social program will be available later.

## FINANCIAL HELP

A limited amount of funds are available for financial help. These may include the payment (partial or total) of the hotel and/or a waiver of the registration fee. No funds will be available for travel expenses. Priority will be given to students and to participants presenting oral contributions.

To apply for financial help, please send an e-mail to [toe2009@astro.up.pt](mailto:toe2009@astro.up.pt) mentioning your needs and a short justification.

## CONTACT INFORMATION

For inquiries concerning travel, accommodation, and other logistic details, please contact the LOC:

Nuno C. Santos/Elsa Silva  
by e-mail [toe2009@astro.up.pt](mailto:toe2009@astro.up.pt)  
by telephone +351 226 089 893  
by fax +351 226 089 831

Please feel free to disseminate this information among your colleagues.

We are looking forward to meeting you in Porto.

On behalf of the SOC and LOC,

With best regards,  
Nuno C. Santos, Claudio Melo, Luca Pasquini, Andreas Glindemann

## 4 OTHER ANNOUNCEMENTS

### *Outros anúncios*

#### **Help shape the European Extremely Large Telescope**

**Paula Teixeira** ; E-mail contact: pteixeir@eso.org

Dear Colleagues,

The European Extremely large Telescope (E-ELT) is entering a decisive year of its design. You can participate in the effort and help to make the E-ELT a success, optimally serving its community.

- Visit the updated E-ELT web pages: <http://www.eso.org/sci/facilities/eelt>
- Submit your favourite E-ELT science case to the Design Reference Science Plan at <http://www.eso.org/sci/facilities/eelt/science/drsp>
- Join us in May for the DRM & DRSP workshop to learn and share your experience in simulating/modelling science cases for the E-ELT: <http://www.eso.org/sci/facilities/eelt/science/drm/workshop09> [Deadline February 16].

further, you might want to:

- Look at the growing E-ELT public picture gallery: <http://www.eso.org/gallery/v/ESOPIA/EELT>
- Download the E-ELT .ppt presentation in 1 slide, that you are welcome to include in any of you talks. <http://www.eso.org/sci/facilities/eelt/docs/index.html>

More details on the above points can be found below. We are looking forward to your feedback, and thank you for helping us making the E-ELT a success.

Best wishes,

Markus Kissler-Patig  
E-ELT Project Scientist  
on behalf of the project

The European Extremely Large Telescope (E-ELT) is in its detailed design phase. By the end of 2010 the project will present a construction proposal for the telescope and the instruments. Thus, many design decision will be taken in 2009, which is the best year for the community to have an impact on the project through feedback.

#### WEB PAGES:

To update the community on the status of the project, both the public as well as the science user web pages of the European Extremely Large Telescope have recently been updated. The science user pages can be found at <http://www.eso.org/sci/facilities/eelt> We would like to invite you to visit the pages and to feel free to contact us if you would like specific information to be added.

#### DRSP:

We hope that this updated overview will generate many ideas of scientific projects to be performed with the E-ELT. An effective way to communicate to us your preferences for the E-ELT capabilities is to submit your favourite science case to the Design Reference Science Plan (DRSP). The DRSP is a collection of science cases provided directly by the future users of the E-ELT. The DRSP aims at exploring the full range of science cases for which the E-ELT will be used. Ultimately, it will help to define the boundaries of the parameter space over which the E-ELT will operate. It will be used to guide the performance optimisation of the telescope, the prioritisation of the instruments, as well as to plan the science operations modes.

The more detailed your feedback, the better. But any input is valuable to the project (e.g. would you rather to do high-spectral resolution observations in the UV or astrometry in the NIR?). Information at the level of a proposal abstract is already very valuable.

In order for the E-ELT to be a success and to optimally serve its community, we need your feedback. We would like to encourage all of you to visit <http://www.eso.org/sci/facilities/eelt/science/drsp> and submit a science case - the sooner, the better.

To help you in assessing the expected performance on the E-ELT, we provided two exposure time calculators, as well as a collection of technical data, at the above URL (under 'Design Reference Mission' in the menu on the right hand side). If you require further help, please feel free to contact us.

DRM & DRSP Workshop:

In May 2009, we are organising a Workshop at ESO in Garching during which we intend to present the result of the DRSP and of the Design Reference Mission (DRM, <http://www.eso.org/sci/facilities/eelt/science/drm>). It will also serve as a forum for the community of E-ELT performance simulators to share the expertise and present their results. You are most welcome to join us. More information can be found at <http://www.eso.org/sci/facilities/eelt/science/drm/workshop09>