ExoPlanet News
An Electronic Newsletter

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Editors: E. Alei, H. Wang, J. Davoult, D. Angerhausen & T.-E. Riesen
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Contents

1 Editorial

Welcome to Edition 162 of the ExoPlanet News!

As usual we bring you abstracts of scientific papers, job ads, conference announcements, and an overview of exoplanet-related articles on astro-ph. Thanks a lot to all of you who contributed to this issue of the newsletter!

We remind you that we recently introduced a new feature with clickable urls and hyperlinks (e.g., to astro-ph articles). The new feature is still at the experimental phase, so we are keen to receive any problem report as well as feedback.

For the next month we look forward to your paper abstracts, job ads or meeting announcements. Also special announcements are welcome. As always, we would also be happy to receive feedback concerning the newsletter. The Latex template for submitting contributions, as well as all previous editions of ExoPlanet News, can be found on the ExoPlanet News webpage (`http://nccr-planets.ch/exoplanetnews/`).

The next issue will appear on January 10, 2023.

We wish you all happy winter holidays!

Thanks again for your support, and best regards from the editorial team,

Eleonora Alei
Haiyang Wang
Jeanne Davoult
Daniel Angerhausen
Timm-Emanuel Riesen

2 Abstracts of refereed papers

The link between infall location, early disc size, and the fraction of self-gravitationally fragmenting discs

O. Schib[1,2], *C. Mordasini*[1], *R. Helled*[2]

[1] Physikalisches Institut, Universität Bern, Gesellschaftsstrasse 6, 3012 Bern, Switzerland
[2] Institute for Computational Science, Universität Zürich, Winterthurerstrasse 190, 8057 Zürich, Switzerland

Astronomy & Astrophysics, accepted (arXive 2211.06433)

Many protoplanetary discs are self-gravitating early in their lives. If they fragment under their own gravity, they form bound gaseous clumps which may evolve to become giant planets. Today, the fraction of discs that undergo fragmentation, and therefore also the frequency of conditions that may lead to giant planet formation via gravitational instability, is still unknown.
We study the formation and evolution of a large number of star-disc systems focusing on the discs' early sizes and their likelihood to fragment. We investigate how the fraction of discs that fragments depends on the disc size distribution at early times.
We perform a population synthesis of discs from formation to dispersal. In varying the infall radius, we study the relationship of the early disc size with fragmentation. Furthermore, we investigate how stellar accretion heating affects the fragmentation fraction.
We find that discs fragment only if they become sufficiently large early in their lives. This size depends sensitively on where mass is added to the discs during the collapse of their parent molecular cloud core. Infall locations derived from pure hydrodynamic (non-ideal magnetized collapse) simulations lead to large (small) discs and a 22% (0%) fragmentation fraction in populations representative of the initial mass function. However, the resulting synthetic disc size distribution is larger (smaller) than the observed Class 0 disc size distribution. By choosing intermediate infall locations leading to a synthetic disc size distribution that is in agreement with the observed one, we find a fragmentation fraction between 0.1 and 11%, depending on the efficiency of stellar accretion heating of the discs.
We conclude that the frequency of fragmentation is strongly affected by the early formation process of the disc and its interaction with the star. The early disc size is mainly determined by the infall location during the collapse of the molecular cloud core and controls the population-wide frequency of fragmentation. Stellar accretion heating also plays an important role for fragmentation and must be studied further. Our work is an observationally-informed step towards a prediction of the frequency of giant planet formation by gravitational instability. Upcoming observations and theoretical studies will deepen our understanding of the formation and early evolution of discs in the near future. This will eventually allow to understand how infall, disc morphology, giant planet formation via gravitational instability, and the observed extrasolar planet population are linked.

Download/Website: `https://arxiv.org/abs/2205.02858`

Contact: `oliver.schib@space.unibe.ch.ch`

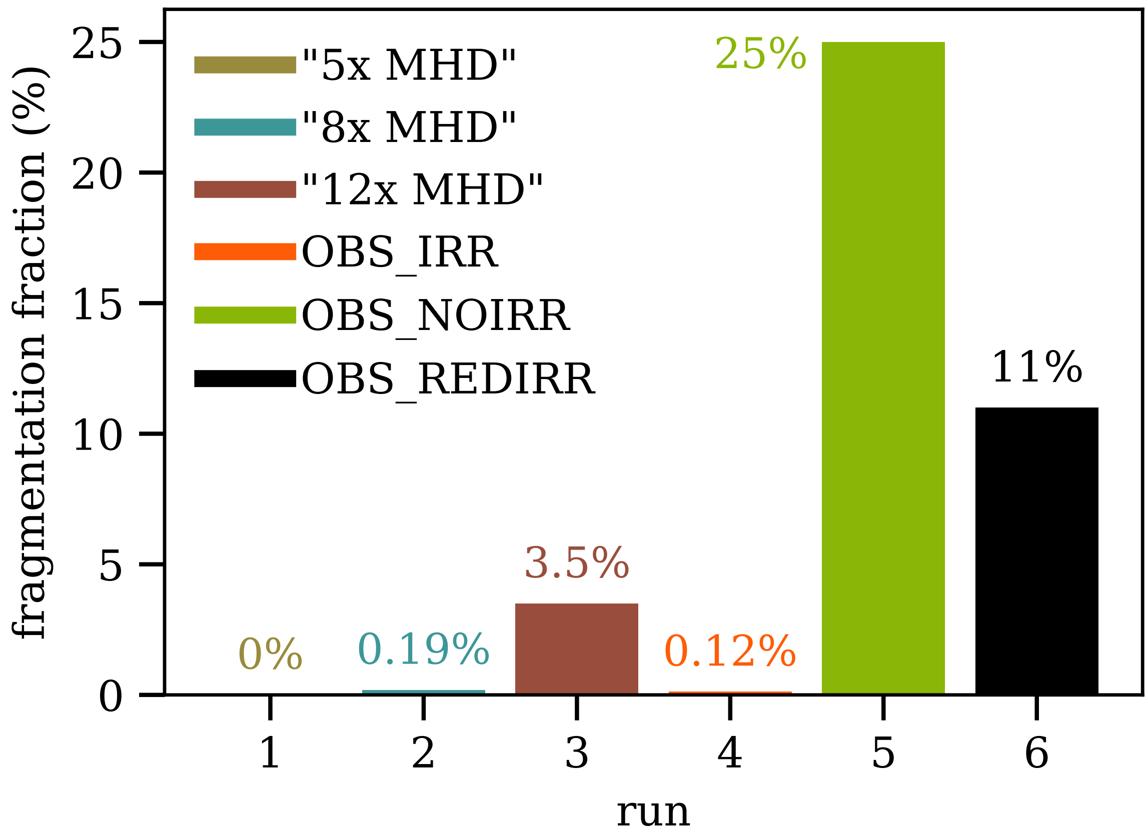

Figure 1: Fraction of fragmenting discs for different populations. OBS_REDIRR is a population that has a distribution of early disc sizes compatible with observations while at the same time exhibiting a distribution of luminosities similar to observed young systems.

Large Interferometer For Exoplanets (LIFE): IV. Where is the phosphine? Observing exoplanetary PH_3 with a space based MIR nulling interferometer

D. Angerhausen, M. Ottiger, F. Dannert, Y. Miguel, C. Sousa-Silva, J. Kammerer, F. Menti, E. Alei, B.S. Konrad, H. S. Wang, S.P. Quanz, and the LIFE collaboration

Astrobiology, in press, arxiv:2211.04975

Phosphine could be a key molecule in the understanding of exotic chemistry happening that occurs in (exo)planetary atmospheres. While phosphine it has been detected in the Solar System's giant planets, it has not been observed in exoplanets yet to date. In the exoplanetary context, however, it has been theorized as to be a potential biosignature molecule. The goal of our study is was to identify which illustrative science cases for PH_3 chemistry are observable with a space-based mid-infrared nulling interferometric observatory like the LIFE (Large Interferometer For Exoplanets) concept. We identified a representative set of scenarios for PH_3 detections in exoplanetary atmospheres varying that vary over the whole dynamic range of the LIFE mission. We used chemical kinetics and radiative transfer calculations to produce forward models of these informative, prototypical observational cases for LIFEsim, our observation simulator software for LIFE. In a detailed, yet first order approximation, it takes a mission like LIFE: (i) about 1h to find phosphine in a warm giant around a G star at 10 pc, (ii) about 10 h in H_2 or CO_2 dominated temperate super-Earths around M star hosts at 5 pc, (iii) and even in 100h it seems very unlikely that phosphine would be detectable in a Venus-Twin with extreme PH_3 concentrations at 5 pc. Phosphine in concentrations previously discussed in the literature is detectable in 2 out of the 3 cases, and it is detected in about an order of magnitude faster than in comparable cases with JWST. We show that there is a significant number of objects accessible for these classes of observations. These results will be used to prioritize the parameter range for the next steps with more detailed retrieval simulations. They will also inform timely questions in the early design phase of a mission like LIFE and guide the community by providing easy-to-scale first estimates for a large part of detection space of such a mission.

Download/Website: `https://arxiv.org/abs/2211.04975`

Contact: `dangerhau@phys.ethz.ch`

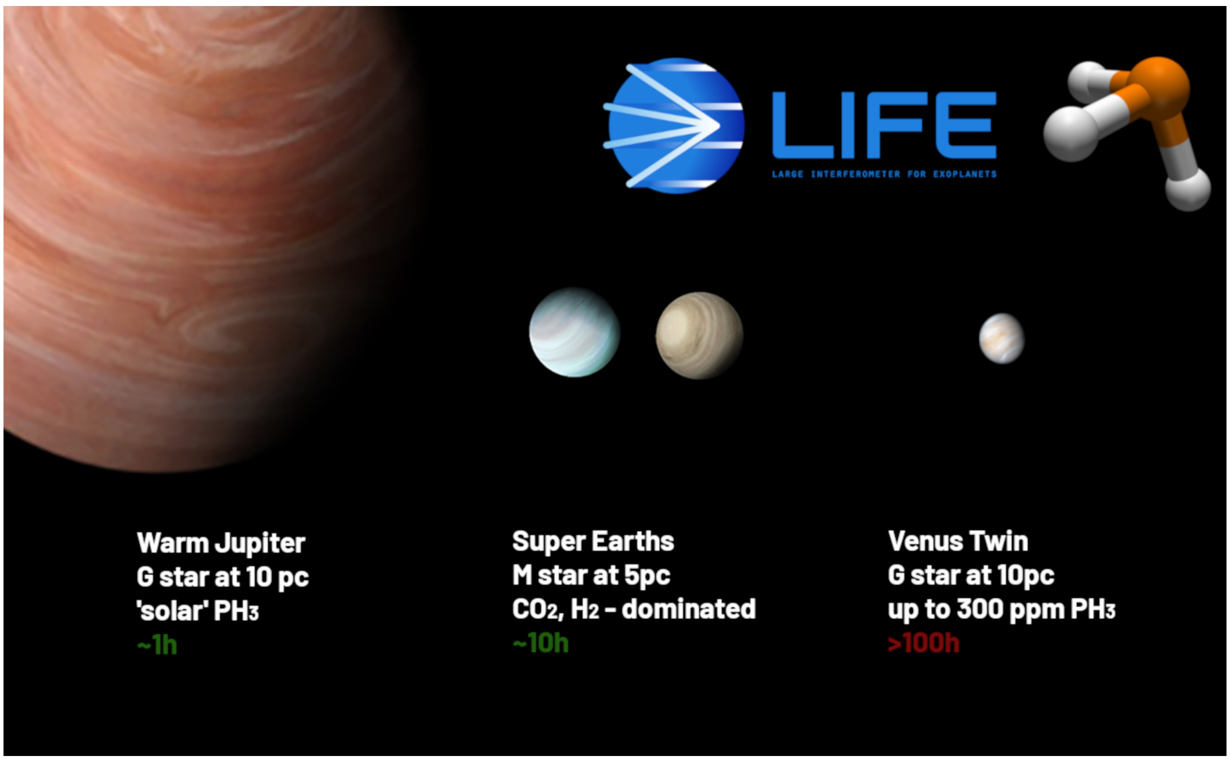

Figure 2: Our study shows it takes a mission like LIFE: (i) about 1h to find phosphine in a warm giant around a G star at 10 pc, (ii) about 10 h in H2 or CO2 dominated temperate super-Earths around M star hosts at 5 pc, (iii) and even in 100h it seems very unlikely that phosphine would be detectable in a Venus-Twin with extreme PH3 concentrations at 5 pc.

Sub-mm/mm optical properties of real protoplanetary matter derived from Rosetta/MIRO observations of comet 67P

J. Bürger[1], *T. Glißmann*[1], *A. Lethuillier*[1], *D. Bischoff*[1], *B. Gundlach*[1], *H. Mutschke*[2], *S. Höfer*[3], *S. Wolf*[4] *and J. Blum*[1]

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[4] Institut für Theoretische Physik und Astrophysik, Christian-Albrechts-Universität zu Kiel, Leibnizstr. 15, Kiel, 24118 Germany

Monthly Notices of the Royal Astronomical Society, accepted (arXiv:2211.12807)

Optical properties are required for the correct understanding and modelling of protoplanetary and debris discs. By assuming that comets are the most pristine bodies in the solar system, our goal is to derive optical constants of real protoplanetary material. We determine the complex index of refraction of the near-surface material of comet 67P/Churyumov-Gerasimenko by fitting the sub-millimetre/millimetre observations of the thermal emission of the comet's sub-surface made by the Microwave Instrument for the Rosetta Orbiter (MIRO) with synthetic temperatures derived from a thermophysical model and radiative-transfer models. According to the two major formation scenarios of comets, we model the sub-surface layers to consist of pebbles as well as of homogeneously packed dust grains. In the case of a homogeneous dusty surface material, we find a solution for the length-absorption coefficient of $\alpha \approx 0.22\ \mathrm{cm}^{-1}$ for a wavelength of 1.594 mm and $\alpha \geq 3.84\ \mathrm{cm}^{-1}$ for a wavelength of 0.533 mm and a constant thermal conductivity of 0.006 $\mathrm{W m^{-1} K^{-1}}$. For the pebble scenario, we find for the pebbles and a wavelength of 1.594 mm a complex refractive index of $n = (1.074 - 1.256) + \mathrm{i}\,(2.580 - 7.431) \cdot 10^{-3}$ for pebble radii between 1 mm and 6 mm. Taking into account other constraints, our results point towards a pebble makeup of the cometary sub-surface with pebble radii between 3 mm and 6 mm. The derived real part of the refractive index is used to constrain the composition of the pebbles and their volume filling factor. The optical and physical properties are discussed in the context of protoplanetary and debris disc observations.

Download/Website: `https://arxiv.org/abs/2211.12807`

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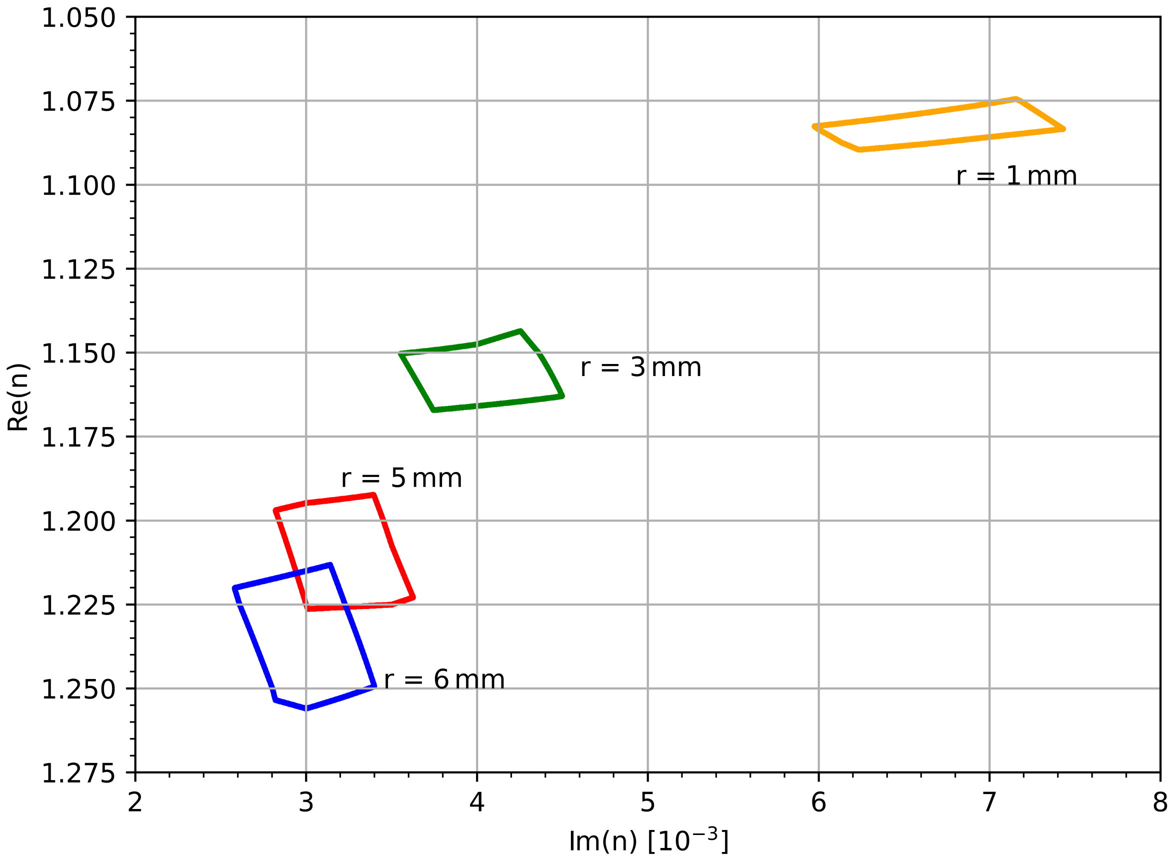

Figure 3: Final solutions of the complex refractive index of the pebbles with radius r. The optical properties are derived from the comparison to the brightness temperatures measured in MIRO's mm channel at a wavelength of 1.594 mm.

The phase curve and the geometric albedo of WASP-43b measured with CHEOPS, TESS and HST WFC3/UVIS

G. Scandariato[1], *V. Singh* [1], *D. Kitzmann*[2], *M. Lendl*[3] *and the CHEOPS collaboration (a complete list of authors can be found on the publication)*

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[2] Center for Space and Habitability, University of Bern, Gesellschaftsstrasse 6, Bern, 3012, Switzerland
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A&A, published (2022A&A...668A..17S)

Observations of the phase curves and secondary eclipses of extrasolar planets provide a window on the composition and thermal structure of the planetary atmospheres. For example, the photometric observations of secondary eclipses lead to the measurement of the planetary geometric albedo $\mathrm{A_g}$, which is an indicator of the presence of clouds in the atmosphere. In this work we aim to measure the $\mathrm{A_g}$ in the optical domain of WASP-43b, a moderately irradiated giant planet with an equilibrium temperature of $\sim$1400 K. To this purpose, we analyze the secondary eclipse light curves collected by CHEOPS, together with TESS observations of the system and the publicly available photometry obtained with HST WFC3/UVIS. We also analyze the archival infrared observations of the eclipses and retrieve the thermal emission spectrum of the planet. By extrapolating the thermal spectrum to the optical bands, we correct the optical eclipses for thermal emission and derive the optical A_g. The fit of the optical data leads to a marginal detection of the phase curve signal, characterized by an amplitude of 160 ± 60 ppm and 80^{+60}_{-50} ppm in the CHEOPS and TESS passband respectively, with an eastward phase shift of $\sim 50°$ (1.5σ detection). The analysis of the infrared data suggests a non-inverted thermal profile and solar-like metallicity. The combination of optical and infrared analysis allows us to derive an upper limit for the optical albedo of $\mathrm{A_g} < 0.087$ with a confidence of 99.9%. Our analysis of the atmosphere of WASP-43b places this planet in the sample of irradiated hot Jupiters, with monotonic temperature-pressure profile and no indication of condensation of reflective clouds on the planetary dayside.

Download/Website: `https://doi.org/10.1051/0004-6361/202243974`

Contact: `gaetano.scandariato@inaf.it`

Transmission spectroscopy of WASP-7 b with UVES:
Detection of Na I D_2 and tentative D_1 line absorption

Hossein Rahmati[1], *Stefan Czesla*[2], *Sara Khalafinejad*[3], *Paul Mollière*[4] *A. Author*[1,2], *B. Author*[1,3], *C. Author*[2]

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Astronomy & Astrophysics, published (2022A&A...668A..24R)

Transmission spectroscopy is a prime technique to study the chemical composition and structure of exoplanetary atmospheres. Strong excess absorption signals have been detected in the optical Na I D1, 2 Fraunhofer lines during transits of hot Jupiters, which are attributed to the planetary atmospheres and allow us to constrain their structure. We study the atmosphere of WASP-7 b by means of high-resolution transit spectroscopy in the sodium lines. We analyzed a spectral transit time series of 89 high-resolution spectra of the hot Jupiter WASP-7 b that was observed using the Ultraviolet and Visual Echelle Spectrograph (UVES). We used the telluric lines for an accurate alignment of the spectra and carried out a telluric correction with `molecfit`. Stellar magnetic activity was monitored by investigating chromospheric lines such as the Ca II H and K, and hydrogen Hα lines. Finally, we obtained transmission spectra and light curves for various lines. The star shows no identifiable flares and, if any, marginal changes in activity during our observing run. The sodium transmission spectra and corresponding light curves clearly show signs of the Rossiter-McLaughlin (RM) effect and the stellar center-to-limb variation (CLV) that we modeled using synthetic spectra. A statistically significant, narrow absorption feature with a line contrast of 0.50 ± 0.06 % (at $\sim 8.3\sigma$ level) and a full width at half maximum (FWHM) of 0.13 ± 0.02 Å is detected at the location of the Na I D_2 line. For the Na I D_1 line signal, we derived a line contrast of 0.13 ± 0.04 % (at $\sim 3.2\sigma$ level), which we consider a tentative detection. In addition, we provide upper limits for absorption by the hydrogen Balmer lines (Hα, Hβ, and Hγ), K I λ7699 Å, Ca II H and K, and infra-red triplet (IRT) lines.

Download/Website: `https://www.aanda.org/articles/aa/pdf/2022/12/aa43955-22.pdf`

Contact: `h.rahmati@alumni.basu.ac.ir`

Stellar obliquities in exoplanetary systems

S. H. Albrecht[1], *R. I. Dawson*[2], *J. N. Winn*[3]

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[3] Department of Astrophysical Sciences, Princeton University, Princeton, NJ 08544, USA

Publications of the Astronomical Society of the Pacific, invited review, published (2022PASP..134h2001A)

The rotation of a star and the revolutions of its planets are not necessarily aligned. This article reviews the measurement techniques, key findings, and theoretical interpretations related to the obliquities (spin-orbit angles) of planet-hosting stars. The best measurements are for stars with short-period giant planets, which have been found on prograde, polar, and retrograde orbits. It seems likely that dynamical processes such as planet-planet scattering and secular perturbations are responsible for tilting the orbits of close-in giant planets, just as those processes are implicated in exciting orbital eccentricities. The observed dependence of the obliquity on orbital separation, planet mass, and stellar structure suggests that in some cases, tidal dissipation damps a star's obliquity within its main-sequence lifetime. The situation is not as clear for stars with smaller or wider-orbiting planets. Although the earliest measurements of such systems tended to find low obliquities, some glaring exceptions are now known in which the star's rotation is misaligned with respect to the coplanar orbits of multiple planets. In addition, statistical analyses based on projected rotation velocities and photometric variability have found a broad range of obliquities for F-type stars hosting compact multiple-planet systems. The results suggest it is unsafe to assume that stars and their protoplanetary disks are aligned. Primordial misalignments might be produced by neighboring stars or more complex events that occur during the epoch of planet formation.

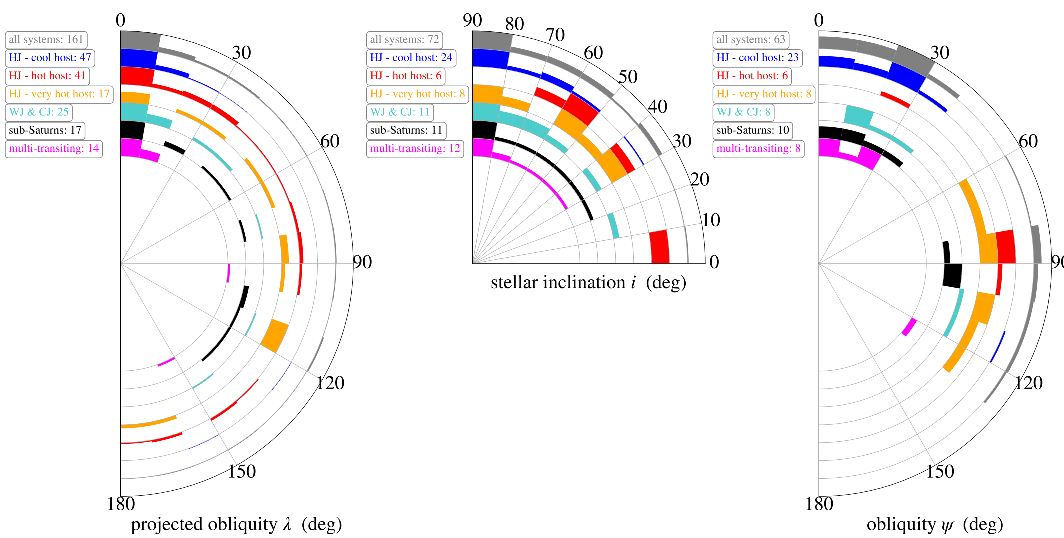

Figure 4: Histograms of host star obliquities. *Left*: Projected obliquities (λ), folded onto the range $[0, 180°]$. *Middle*: Stellar inclination measurements (i), folded onto the range $[0, 90°]$. *Right:* Three-dimensional obliquities (ψ), for the cases in which λ and i have both been measured. The histograms are color-coded according to the system's characteristics. Stars are designated as cool, hot, or very hot, using effective temperature boundaries of 6250 K and 7000 K. Planets with masses exceeding $0.3\,\mathrm{M_{Jup}}$ are designated hot Jupiters (HJ) if $a/R < 10$, and warm/cold Jupiters (WJ/CJ) if $a/R > 10$. Planets with masses $\leq 0.3\ M_{\mathrm{Jup}}$ are designated sub-Saturns.

Download/Website: `https://ui.adsabs.harvard.edu/abs/2022PASP..134h2001A/abstract`

Contact: `albrecht@phys.au.dk`

3 Jobs and Positions

Observation and theoretical interpretation of forming planets and protoplanetary disks with RISTRETTO

Christoph Mordasini
Division of Space Research and Planetary Sciences, University of Bern, Gesellschaftsstrasse 6, 3012 Bern

Bern, 1.1.23

Applications are invited for a postdoctoral position in the context of future observations of forming planets and protoplanetary disks with the RISTRETTO instrument. The position is available in the research group of Prof. Christoph Mordasini at the University of Bern in strong collaboration with Prof. Christophe Lovis at the University of Geneva.

The direct observation and theoretical study of forming planets and protoplanetary disks containing forming planets is a fascinating recent development. The goal of this position is to study this science case by targeting forming planets and planet-forming disks with high spatial + high spectral resolution instruments like in particular RISTRETTO. RISTRETTO (PI: Christophe Lovis) is currently under construction to be eventually installed as visitor instrument at the ESO VLT and will combine ultra high spectral and spatial resolution. Specific tasks will include the definition of the optimal observations given the instrument characteristics, observing modes and strategies, identification of targets, comparison of expected observations with theoretical models to constrain for example different modes of planetary gas accretion, the dynamics of gas in planet-forming disks, or the exploitation of the information content of spectrally resolved emission lines resulting from accretion. This information will be used to define future observations with RISTRETTO. The work thus includes observational, instrumental, and theoretical aspects.

We seek an excellent candidate with experience in the aforementioned subject. Applicants must have a PhD in astronomy, (astro)physics, planetary sciences or a related field. The person should be proactive, enthusiastic, communicative, and should in particular establish a strong link between the theory group in Bern and observational group in Geneva to where regular and extended visits will be made, working closely with the RISTRETTO team (astronomers and engineers).

The University of Bern offers a vibrant scientific environment: The Division of Space Research and Planetary Sciences is an established centre in the theoretical research of planet formation as well as in numerous instrumental projects. The collaboration for RISTRETTO continues a long line of similar collaborations of Bern and Geneva with instruments like HARPS, ESPRESSO, NIRPS or ANDES. The University of Bern also leads the Swiss National Center of Competence in Research in planetary sciences NCCR PlanetS. The University of Bern also hosts the Center of Space and Habitability (https://www.csh.unibe.ch) and is the leading house of the ESA transit satellite CHEOPS. This environment creates rich opportunities for collaborations with researchers at all these institutions. The city of Bern offers an excellent and international living environment and is consistently ranked as one of the world's best cities for quality of living by the Mercer survey.

The successful applicant will have access to substantial expenses for travel and computing equipment. Swiss postdoc salaries are very competitive even considering the comparatively high local costs of living, and are set by standard local regulations based on age and experience. The University of Bern is an equal opportunity employer, and female researchers and members of minorities are specially encouraged to apply.

The appointment is for two years. Applicants should submit a cover letter (max. 1 page), a 3 page research statement, a publication list, and a CV (max. 2 pages) to Christoph Mordasini, christoph.mordasini@unibe.ch and to Christophe Lovis, Christophe.Lovis@unige.ch. Applicants should also arrange for three letters of recommendation to be directly submitted to the same email addresses. Full consideration will be given to applications received by 15. February 2023. The position is available immediately and an early start would be ideal.

Contact: `christoph.mordasini@unibe.ch`

4 Conferences and Workshops

1st announcement: TOEIII - Planet-Star Connection (Porto, Portugal)

Susana Barros[1]*, Elisa Delgado Mena*[1]*, Olivier Demangeon*[1]*, Sergio Sousa*[1]
Instituto de Astrofísica e Ciências do Espaço (IA), Portugal

Porto, Portugal, 17-21 July 2023

Planetary systems result from the synergy between the stars and the planets they host. It can be convenient, at first, to consider them in isolation, but the links between them affect all aspects of exoplanetary sciences. Stars can be a hurdle to exoplanetary sciences. The precision and accuracy of our knowledge of stellar parameters is often a major driver for the precision and accuracy of the respective planetary parameters. Stellar activity and its impact on planet detection and characterisation is one of the significant challenges for the next decade. But stars can also be facilitators to exoplanetary sciences. The correlation between stellar metallicity and the frequency of giant planets is well established and the link between stellar and planetary composition is an active topic. In the next few years we also have a lot to learn from the dynamical interactions between stars and planets.
With this new edition of the Towards Other Earth conference series, we aim to gather again scientists from all around the world in Porto (Portugal), to discuss what has been learned from studying stars and planets together. In particular we wish to address:

- The impact of stellar activity on planet detection and characterisation but also on the evolution of planets and their atmospheres;
- The link between the stellar properties and the frequency, bulk and atmospheric composition of planets;
- The implications and different effects of the dynamical interactions between the stars and the planets that they host.

Download/Website: `http://www.iastro.pt/toe3/`
Contact: `toe3-loc@googlegroups.com`

EGU 2023 session PS3.1: Advances in Modeling the Formation and Chemical Composition of Terrestrial Planets

Nader Haghighipour, Samuele Crespi, Birgit Loibnegger

Vienna, Austria, April 23-28, 2023

Dear colleagues,

We cordially invite you to submit abstracts to the EGU session PS3.1, Advances in Modeling the Formation and Chemical Composition of Terrestrial Planets. The session will be held during the EGU General Assembly in April, 23-28, 2023 in Vienna, Austria.

The past few years have seen major advances in theories of terrestrial planet formation. Pebble accretion has opened new chapters and accurate simulations of giant impacts have paved the way for the formation models to become quantitative. Also, recent ideas on the early instabilities in our solar system allow for adopting more realistic initial conditions. These advances have also paved the way for simulating the formation of other planetary systems. The session PS3.1 focuses on these topics through a combination of invited, contributed, and poster presentations. We welcome abstracts for oral and poster contributions in all areas related to theoretical, observational and experimental studies of terrestrial planet formation in our solar system and extrasolar planets.

For more details and submitting abstracts, please see

https://meetingorganizer.copernicus.org/EGU23/session/45442

Abstract Deadline: January 10, 2023

Looking forward to seeing you in Vienna

Convenors: Nader Haghighipour, Samuele Crespi, Birgit Loibnegger

2023 Sagan Summer Hybrid Workshop
Characterizing Exoplanet Atmospheres: The Next Twenty Years

T. Chen, D. Gelino
NASA Exoplanet Science Institute, California Institute of Technology, Pasadena, CA, USA

Hybrid Workshop, July 24-28, 2023

Observations of an exoplanet's atmosphere provide the best hope for distinguishing the makeup of its outer layers, and the only hope for understanding the interplay between formation, natal composition, chemical and disequilibrium processes, and dynamics and circulation. The field is entering a revolution in our understanding of exoplanet atmospheres thanks to measurements from the ground, from space, and particularly from JWST, the superlative facility for exoplanet studies. In the longer term, such observations will also be essential for seeking signs of biosignature gasses in nearby exoplanets using future, next-generation observatories.

Workshop Topics

- Atomosphere Fundamentals
- Direct Imaging and Spectroscopy
- Transmission, Secondary Eclipses, and Phase Curves
- Interferometric Observations
- Star-Planet Interactions
- Lessons Learned from Brown Dwarfs and the Solar System
- Atmospheric Escape and Mass Loss
- Observations of Terrestrial Exoplanet Atmospheres
- Retrievals and Fitting models to Data
- Prospects for Bio- and Techno- Signatures
- JWST Transit Science and Imaging
- Future Facilities

This year's workshop will cover theoretical modeling, interpretation, and observations of exoplanets using a variety of telescopes, techniques, and hands-on exercises, presented by leading experts in the field. The hands-on sessions will address reducing and fitting JWST data and also give attendees experience with tools for modeling and retrieving exoplanet atmospheres.

We currently plan to hold the 2023 workshop as a hybrid with both in-person and on-line attendance. It is unclear at this time (December 2022) what, if any, public health restrictions will be in place in July 2023 due to COVID.

The Sagan Summer Workshops are aimed at advanced undergraduates, grad students, and postdocs, however all are welcome to attend. Attendees will also participate in hands-on tutorials and have the chance to meet in smaller groups with our speakers.

There is no registration fee for this workshop and registration will open in February 2023.

Please contact us with any questions or to be added to the email list.

Download/Website: `http://nexsci.caltech.edu/workshop/2023`
Contact: `sagan_workshop@ipac.caltech.edu`

The 5th Workshop on Extremely Precise Radial Velocities

J. Burt, B. J. Fulton, SOC Co-Chairs

Conference, March 27-30, 2023

Registration and lodging information for The Fifth Workshop on Extremely Precise Radial Velocities (EPRV 5) will be available by December 20! Please visit the website and look in your inbox soon for more information. We also expect the conference agenda to be available by the end of the month.

EPRV 5 will provide an opportunity to discuss key technical and scientific issues after a gap of four years since the last comparable meeting. The conference will feature talks from all major instrument and data analysis teams, to ensure that the community is aware of what each independent node is working towards and what challenges they are facing. We will invite representatives from stellar physics and heliophysics to increase the knowledge transfer between our fields and to hopefully spark new, cross disciplinary collaborations. A primary objective of the meeting agenda will be to allow ample time for discussion both during and after talk sessions, so that participants can engage in the level of detailed conversation that has made previous iterations such a boon to the field.

Submissions for poster presentations will be accepted until February 17, 2023. If you have any questions, contact the conference co-chairs Jennifer Burt (jennifer.burt@jpl.nasa.gov) and BJ Fulton (bjfulton@ipac.caltech.edu) or email us at eprv5@lists.astro.caltech.edu

Download/Website: `https://conference.ipac.caltech.edu/eprv5/`

Contact: `eprv5@lists.astro.caltech.edu`

5 As seen on astro-ph

The following list contains exoplanet related entries appearing on astro-ph in November 2022.
Disclaimer: The hyperlinks to the astro-ph articles are provided for the convenience of the reader, but the ExoPlanet News cannot be responsible for their accuracy and perpetuity.

November 2022

astro-ph/2211.00633: **Clouds form on the hot Saturn JWST ERO target WASP-96b** *by Dominic Samra et al.*
astro-ph/2211.00649: **Exploring the Ability of HST WFC3 G141 to Uncover Trends in Populations of Exoplanet Atmospheres Through a Homogeneous Transmission Survey of 70 Gaseous Planets** *by Billy Edwards et al.*
astro-ph/2211.00667: **HD 191939 revisited: New and refined planet mass determinations, and a new planet in the habitable zone** *by J. Orell-Miquel et al.*
astro-ph/2211.00702: **Importance of Sample Selection in Exoplanet Atmosphere Population Studies** *by Natasha E. Batalha et al.*
astro-ph/2211.00703: **Refining the Masses and Radii of the Star Kepler-33 and its Five Transiting Planets** *by James Sikora et al.*
astro-ph/2211.00994: **Chasing extreme planetary architectures: I- HD196885Ab, a super-Jupiter dancing with two stars?** *by G. Chauvin et al.*
astro-ph/2211.01044: **The discovery of three hot Jupiters, NGTS-23b, 24b and 25b, and updated parameters for HATS-54b from the Next Generation Transit Survey** *by David G. Jackson et al.*
astro-ph/2211.01459: **Spectroscopic Time-series Performance of JWST/NIRSpec from Commissioning Observations** *by Néstor Espinoza et al.*
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