

# Hamburg

## Hamburger Sternwarte

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### 0 Allgemeines

Die 1833 in der Nähe des Hamburger Hafens gegründete Sternwarte wurde 1912 auf den Gojenberg im östlich vom Hamburger Zentrum gelegenen Bergedorf verlegt (B: 53.4806, L: 10.2408 Grad). 1968 wurde die Sternwarte Teil des Fachbereichs Physik der Universität Hamburg. Hier befinden sich die Lehrstühle und Arbeitsgruppen im Bereich der Astrophysik. Neben Forschung und Lehre gewinnt an der Sternwarte die Öffentlichkeitsarbeit zunehmend an Bedeutung. 2021 wurden zu astronomischen Themen 98 schriftliche und rund 150 telefonische Anfragen aus der Öffentlichkeit sowie 18 Presseanfragen bearbeitet und beantwortet. Obwohl die Sternwarte auch 2021 pandemiebedingt von Januar bis einschl. August für Besucher nicht geöffnet werden konnte und auch ab September die Teilnehmerzahlen noch stark beschränkt waren, war das Interesse der Öffentlichkeit an der Sternwarte und astronomischen Themen weiterhin groß. Insgesamt wurden rund 2000 Teilnahmen an öffentlichen Veranstaltungen gezählt, davon rund 1100 digital und rund 900 in Präsenz von September bis Dezember. Hinzu kamen das ganze Jahr über täglich durchschnittlich rund 50 Pers., die den Astronomiepark mit geführtem Schilderrundgang besuchten. In Zusammenarbeit mit dem Förderverein bietet die Sternwarte jeden Sonntag öffentliche Rundgänge an, im Winterhalbjahr außerdem einmal im Monat eine Führung mit Beobachtungsmöglichkeit. Auch die Buchung von Sonderführungen ist möglich und gut nachgefragt. Verschiedene auf der Sternwarte vorhandene historische Instrumente sowie ein kleines Radioteleskop bieten für Veranstaltungen sehr gute Voraussetzungen. Die rege Nachfrage der Öffentlichkeit nach Bildungsangeboten und Veranstaltungen zu astronomischen Themen kann allerdings aus personellen Gründen weiterhin nur auf ehrenamtlicher Basis und daher in sehr eingeschränktem Maße bedient werden. Im Oktober 2021 hat die Hansestadt Hamburg bei der Kultusministerkonferenz einen Antrag auf Aufnahme der Hamburger Sternwarte in die bundesweite Tentativliste der UNESCO-Weltkulturerbekandidaturen ab 2025 gestellt.

# 1 Personal und Ausstattung

## 1.1 Personalstand

*Direktoren und Professoren: 6*

Prof. Dr. Robi Banerjee (Geschäftsführender Direktor), Mitglied Exzellenz-Cluster Quantum-  
Universe

Prof. Dr. Marcus Brüggem, Mitglied Exzellenz-Cluster Quantum-Universe

Prof. Dr. Peter Hauschildt

Prof. Dr. Jochen Liske, Mitglied Exzellenz-Cluster Quantum-Universe, Vertreter Deutsch-  
lands im wissenschaftlich-technischen Beirat der ESO

Prof. Dr. Günter Wiedemann

Juniorprof. Dr. Francesco de Gasperin

*Wissenschaftliche Mitarbeiter: 37*

Arora, Raghav

Dr. Banda-Barragan, Wladimir

Böckmann, Kathrin

Casura, Sarah

Dr. Cuciti, Virginia

Dr. da Silva Pereira, Maria Elidaiana (ab 03.08.)

Deepali, Deepali

Edler, Henrik

Fischer, Moritz Serenus

Freund, Sebastian

Dr. Fuhrmeister, Birgit

Gajović, Lovorka (ab 01.09.)

Dr. Gao, Feng

Dr. Gonzáles-Pérez, José Nicolas

Dr. Grete, Philipp

Dr. Hagen, Hans-Jürgen

Dr. Heesen, Volker

Dr. Heneka, Caroline

Dr. Hoang, Duy

Jones, Alexander

Körtgen, Bastian

Dr. Kummer, Janis

Lusetti, Giulia (ab 15.09.)

Dr. Mittag, Marco

Dr. Nagel, Evangelos

Pasini, Thomas

Dr. Passegger, Vera-Maria

Dr. Rafferty, David

Rao, Suvrat

Dr. Robrade, Jan

Sbaffoni, Antonio (ab 01.09.)

Dr. Schmidt, Tobias

Dr. Schneider, Christian

Dr. Schweitzer, Andreas

Selg, Simon

Simonte, Marco (ab 01.04.)

Trivedi, Pranjal (01.05. bis 31.11.)

Dr. Wichmann, Rainer

Dr. Wittor, Denis

*Doktoranden: 14*

*Sekretariat und Verwaltung: 1*

Främcke, Wiebke

*Bibliothek: 1*

Vollersen, Anke

*Verwaltung: 1*

Kleinloth, Angelika (Jan.-Okt.)

Michaelson, Olaf (Okt.-Dez.)

*Technische Mitarbeiter: 11*

## 1.2 Instrumente und Rechenanlagen

Kleines Radioteleskop KRT3; LOFAR-Station Norderstedt, Oskar-Lühning-Teleskop; TIGRE-Teleskop

## 2 Wissenschaftliche Arbeiten

*Interstellares Medium/Sternentstehung*

- Dynamik des interstellaren, magnetisierten Mediums in Scheibengalaxien - Struktur und Ausdehnung von HII-Regionen in Molekülwolken - Untersuchung der Säulendichte: Struktur und Vollständigkeit

*Stellarphysik*

- Der Applegate-Mechanismus: Eklipszeitvariation durch magnetische Aktivität

*Kosmologie*

- Heizeffizienz durch kosmologische Magnetfelder während der Rekombination - Beobachtbare Effekte durch Theorien variierender Lichtgeschwindigkeit

*Extragalaktische Astronomie*

- Entwicklung von Galaxien: Verschmelzungen, Bulge-Scheiben Zerlegung - Folgebeobachtungen von Gravitationswellen-Events - Instrumentierung: 4MOST und ELT-HIRES

*Radioastronomie*

- Diffuse Radioquellen und AGN

*Astrophysikalische Hydrodynamik*

- Stoßwellen, Multiphasenströmungen - Turbulenz und Magnetohydrodynamik

*Sternatmosphären*

- Atmosphärenmodellierung von M-Zwergen und pre-CVs - 3D-Strahlungstransporttechniken - HPC-Methoden - 3D-Strahlungstransport in komplexen Geometrien - Spektralanalyse der CARMENES-M-Zwergs sowie von A-Sternen und Novae - Radialgeschwindigkeitsanalyse von spektroskopischen Doppelsternen

### 3 Akademische Abschlussarbeiten

#### 3.1 Bachelorarbeiten

*Abgeschlossen: 6*

Teutloff, Felix: Shock waves in magnetohydrodynamical simulations of galactic wind-cloud interactions. Hamburg, Hamburger Sternwarte, Bachelorarbeit, 2021

Klocke, Tim-Leon: Investigating Magnetic Fields in Nearby Galaxies with LOFAR. Hamburg, Hamburger Sternwarte, Bachelorarbeit, 2021

Smolinski, David Christoph: Numerische Simulationen von Galaxienkollisionen. Hamburg, Hamburger Sternwarte, Bachelorarbeit, 2021

Bliefert, Tobias: Wie präzise lassen sich Exoplaneten vermessen ? Hamburg, Hamburger Sternwarte, Bachelorarbeit, 2021

Gaida, Jan L.: Brightness variations of cosmologically distant objects. Hamburg, Hamburger Sternwarte, Bachelorarbeit, 2021

Olumee, Ali: Line broadening due to Stark and Van der Waals interactions for astronomically interesting atoms. Hamburg, Hamburger Sternwarte, Bachelorarbeit, 2021

#### 3.2 Masterarbeiten

*Abgeschlossen: 2*

Bürger, Jan: Klassifikation von Galaxiespektren mit & ohne neuronalen Netzen. Hamburg, Hamburger Sternwarte, Masterarbeit, 2021

Neutsch, Steffen: 3D Deep Learning Astrophysics and Dark Matter Properties from 21cm-Tomography of Reionisation and Cosmic Dawn. Hamburg, Hamburger Sternwarte, Masterarbeit, 2021

#### 3.3 Dissertationen

*Abgeschlossen: 1*

Prodöhl, Fiona: Synthetic spectra of the secondary of the binary star system AA Dor with PHOENIX/3D. Hamburg, Hamburger Sternwarte, Dissertation, 2021

#### 3.4 Habilitationen

*Abgeschlossen: 0*

## 4 Veröffentlichungen

#### 4.1 In referierten Zeitschriften (Anzahl)

Achikanath Chirakkara, R., Federrath, C., Trivedi, P., & Banerjee, R.: Efficient Highly Subsonic Turbulent Dynamo and Growth of Primordial Magnetic Fields. *PhRvL*, **126** (2021), 091103

Amado, P. J., Bauer, F. F., Rodríguez López, C., ... Perdelwitz, V. ... Schweitzer, A. ... et al.: The CARMENES search for exoplanets around M dwarfs. Two terrestrial planets orbiting G 264-012 and one terrestrial planet orbiting Gl 393. *A&A*, **650** (2021), A188

Angelinelli, M., Ettori, S., Vazza, F., & Jones, T. W.: Properties of clumps and filaments around galaxy clusters. *A&A*, **653** (2021), A171

Arora, R., Krumholz, M. R., & Federrath, C.: Quantifying stochasticity-driven uncertainties in H II region metallicities. *MNRAS*, **508** (2021), 3290

Arulanantham, N., France, K., Hoadley, K., Schneider, P. C., Espaillat, C. C., Günther, H. M., Herczeg, G. J., & Brown, A.: UV Fluorescence Traces Gas and Ly $\alpha$  Evolution in Protoplanetary Disks. *AJ*, **162** (2021), 185

- Ashall, C., Lu, J., Hsiao, E. Y., ... Baron, E. ... et al.: Carnegie Supernova Project: The First Homogeneous Sample of Super-Chandrasekhar-mass/2003fg-like Type Ia Supernovae. *ApJ*, **922** (2021), 205
- Banda-Barragán, W. E., Brügger, M., Heesen, V., Scannapieco, E., Cottle, J., Federrath, C., & Wagner, A. Y.: Shock-multicloud interactions in galactic outflows - II. Radiative fractal clouds and cold gas thermodynamics. *MNRAS*, **506** (2021), 5658
- Banfi, S., Vazza, F., & Gheller, C.: On the alignment of haloes, filaments and magnetic fields in the simulated cosmic web. *MNRAS*, **503** (2021), 4016
- Baroch, D., Morales, J. C., Ribas, I., ... Schweitzer, A. ... et al.: The CARMENES search for exoplanets around M dwarfs. Spectroscopic orbits of nine M-dwarf multiple systems, including two triples, two brown dwarf candidates, and one close M-dwarf-white dwarf binary. *A&A*, **653** (2021), A49
- Bernardinelli, P. H., Bernstein, G. M., Montet, B. T., ... Pereira, M. E. S. ... et al.: C/2014 UN<sub>271</sub> (Bernardinelli-Bernstein): The Nearly Spherical Cow of Comets. *ApJL*, **921** (2021), L37
- Bluhm, P., Pallé, E., Molaverdikhani, K., ... Passegger, V. M., ... Schweitzer, A. ... et al.: An ultra-short-period transiting super-Earth orbiting the M3 dwarf TOI-1685. *A&A*, **650** (2021), A78
- Bonafede, A., Brunetti, G., Vazza, F., Simionescu, A., Giovannini, G., Bonnassieux, E., Shimwell, T. W., Brügger, M., van Weeren, R. J., Botteon, A., Brienza, M., Cassano, R., Drabent, A., Feretti, L., de Gasperin, F., Gastaldello, F., di Gennaro, G., Rossetti, M., Röttgering, H. J. A., Stuardi, C., & Venturi, T.: The Coma Cluster at LOW Frequency ARray Frequencies. I. Insights into Particle Acceleration Mechanisms in the Radio Bridge. *ApJ*, **907** (2021), 32
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- Botteon, A., Cassano, R., van Weeren, R. J., Shimwell, T. W., Bonafede, A., Brügger, M., Brunetti, G., Cuciti, V., Dallacasa, D., de Gasperin, F., Di Gennaro, G., Gastaldello, F., Hoang, D. N., Rossetti, M., & Röttgering, H. J. A.: Discovery of a Radio Halo (and Relic) in a  $M500 < 2 \times 10^{14} M_{\odot}$  Cluster. *ApJL*, **914** (2021), L29
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#### 4.2 Konferenzbeiträge (Anzahl)

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