

Proseminar: Astrophysik, Wintersemester 2026/27

Infos: Robi Banerjee, Hamburger Sternwarte, banerjee@hs.uni-hamburg.de
hsweb.hs.uni-hamburg.de/projects/star-formation

- **Vorbesprechung am 12. Oktober 2026 um 13 Uhr, Jungiusstraße 9, Hörsaal III**
- **Blockseminar:** Termine werden in der Vorbesprechung vereinbart.
- Ort: Hamburger Sternwarte, *Sonnenbau*
- Vortrag: 20 Minuten, Vortragsfolien werden als Zusammenfassung/Ausarbeitung gewertet
- + 10 Minuten Diskussion und Nachbesprechung
- Freie Themenauswahl nach Absprache; Vorschläge siehe nächste Seiten
- Vortrag kann auf Deutsch oder Englisch gehalten werden
- Vortragsbesprechung bis 7 Tage vor dem Termin möglich; Terminvereinbarung mindestens 7 Tage vorher
- Lehrbücher
 - Weigert, Wendker & Wisotzki, *Astronomie und Astrophysik*, 2009
 - Unsöld & Baschek, *Der Neue Kosmos*, 2006
 - Shu, *The Physics of Astrophysics, II*, 1992
 - Schulz, *The Formation and Early Evolution of Stars*, 2012
 - Bodenheimer, *Principles of Star Formation*, 2011
 - Ward-Thompson & Whitworth, *An Introduction to Star Formation*, 2011
 - Stahler & Palla, *The Formation of Stars*, 2004
 - Bally & Reipurth, *The Birth of Stars and Planets*, 2006
 - Larson, *The physics of star formation*, Report 2003
 - Armitage, *Astrophysics of Planet Formation*, 2010
 - Klahr & Brandner (Eds.), *Planet Formation*, 2011
 - Binney & Tremaine, *Galactic Dynamics*, 2008
 - Kolb & Turner, *The Early Universe*, 2005
 - Liddle, *Einführung in die moderne Kosmologie*, 2009
 - P. Schneider, *Extragalaktische Astronomie und Kosmologie*, 2007
 - S. Weinberg, *Cosmology*, 2008

- Die Themen sind nach **Absprache** frei wählbar. *Themenvorschläge:*
 - **Instellare Medium (ISM): Zusammensetzung, Dynamik, Geschichtliches** (Weigert et al., 2009; Breitschwerdt, 1998)
 - **Molekülwolken und Turbulenz** (Ballesteros-Paredes et al., 2007; Ballesteros-Paredes, 2004; Blitz et al., 2007)
 - **Entstehung massereicher Sterne** (Zinnecker & Yorke, 2007; Beuther et al., 2007; McKee & Ostriker, 2007)
 - **Suche nach extrasolaren Planeten, Methoden & Techniken** (Dvorak, 2007; Ollivier et al., 2009; Seager, 2011)
 - **Entstehung von Planeten** (Armitage, 2010; Klahr & Brandner, 2011)
 - **Moderne Teleskope und deren Ziele: z.B. ALMA, PLANCK, GAIA, eROSITA, SKA, E-ELT, JWST, TESS, PLATO, EUCLID**
 - **Entstehung der ersten Sterne** (auch einzelne Aspekte, z.B. chemische und thermodynamische Entwicklung, SN-feedback) (Bromm et al., 2009; Abel et al., 2002; Glover, 2005; Greif, 2014)
 - **Kosmische Hintergrundstrahlung (CMBR): Entstehung, Fluktuationen** (Weinberg, 2008; Kolb & Turner, 1994; Schneider, 2006; Durrer, 2008)
 - **Entstehung der ersten Elemente: Big-Bang-Nukleosynthese** (Weinberg, 2008; Kolb & Turner, 1994)
 - **Supernovae–Dunkle-Energie Projekte** (The Supernova Cosmology Project, High-Z SN search Team: Perlmutter, 2003; Perlmutter & Schmidt, 2003; Perlmutter, 2005; Riess, 2000)
 - **Erkenntnisse von *Dark Energy Spectroscopic Instrument* (DESI)** (DESI Collaboration, 2024; DESI Collaboration, 2024)
 - **Inter-/Extragalaktische Magnetfelder** (Neronov & Semikoz, 2009; Neronov & Vovk, 2010; Tavecchio et al., 2010; Taylor et al., 2011)
 - **Ergebnisse der GAIA Mission** (z.B. Lindegren et al., 2016; Gaia Collaboration et al., 2016)
 - **Event Horizon Telescope (EHT): Beobachtung Schwarzer Löcher** (EHT Web page, 2022; Event Horizon Telescope Collaboration, 2019, 2022)
 - **Direkter Nachweis von Gravitationswellen** (Abbott et al., 2016a,b; Sathyaprakash & Schutz, 2009)
 - **Gravitationswellen Teleskope: LIGO, eLISA, Einstein Teleskop**
 - **Pulsar Timing Arrays: Gravitationswellen im nano-Hertz Bereich** (Mingarelli et al., 2026)
 - **Gammablitze, *Gamma Ray Bursts*** (Janka, 2011; Janka et al., 2011)
 - **Fast Radio Bursts** (z.B. Keane, 2018; Pen, 2018; Platts et al., 2018)
 - **Astroseismologie** (Aerts et al., 2010; Di Mauro, 2017)

References

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- , First Sagittarius A* Event Horizon Telescope Results. I. The Shadow of the Supermassive Black Hole in the Center of the Milky Way. 2022, *ApJ*, 930, L12
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