Curriculum Vitae: Eric P. Andersson

Personal & Contact Information

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Work Address:
American Museum of Natural History,
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200 Central Park W, New York,
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Research Interest

Galaxy formation and evolution, star clusters, star formation, stellar evolution, stellar feedback and chemical enrichment, computational hydrodynamics

Publications

Total of 22 refereed publications (6 first author), 4 publications in review,
1 refereed conference proceeding (link to ADS)

Research experience

(2024 - now) **Research Scientist**
Dept. of Astrophysics, American Museum of Natural History, NY, USA
- Self-funded by NASA ROSES ATP Grant 80NSSC24K093

(2023 - 2024) **Postdoctoral researcher**
Dept. of Astrophysics, American Museum of Natural History, NY, USA
- Scientific mentor: Prof. Mordecai-Mark Mac Low

(2018) **Internship in Astrophysics**
Dept. of Astronomy and Theoretical Physics, Lund University, Sweden
- Project: *Tidal stripping as a mechanism for placing globular clusters on wide orbits: the case of MGC1 in M31*
- Scientific mentor: Prof. Melvyn B. Davies

(2017) **Internship in Astrophysics**
Dept. of Astronomy and Theoretical Physics, Lund University, Sweden
- Project: *Implementation and testing of new adaptive-particles algorithm for the PENCIL code*
- Scientific mentor: Dr. Chao-Chin Yang

Education

(2018 - 2022) **Doctoral student of astronomy**
Dept. of Astronomy and Theoretical Physics, Lund University, Sweden
- Thesis: *The galactic scale impact of feedback from individual stars*
- Advisors: Dr. Oscar Agertz & Dr. Florent Renaud,

(2016 - 2018) **Master student of Astrophysics**
Dept. of Astronomy and Theoretical Physics, Lund University, Sweden
- Thesis: *Can tidal interactions produce MGC1?*
- Advisor: Prof. Melvyn B. Davies

(2013 - 2016) **Bachelor student of Theoretical physics**
Dept. of Astronomy and Theoretical Physics, Lund University, Sweden
- Thesis: *Fast-forward the Sedimentation of Solid Particles in Protoplanetary Disks*
- Advisor: Dr. Chao-Chin Yang

Selected Talks

(7 July, 2025) **CITA Seminar** (Toronto, Canada)
Invited seminar: *The star-by-star formation of the smallest galaxies*

(12 June, 2025) **Romeo-fest** (Gothemburg, Sweden)
Invited talk: *Individual stars in high resolution galaxy simulation: star formation and stellar feedback*

(5 June, 2025) **Lund Observatory seminar** (Lund, Sweden)
Invited seminar: *The star-by-star formation of the smallest galaxies*

(30 May, 2025) **Bally-fest** (Visengrad, Hungary)
Contributed talk: *Galaxy simulations with individual stars & the formation of the smallest galaxies*

(23 April, 2025) **Seminar at Yale** (New Haven, US)
Invited seminar: *The star-by-star formation of the smallest galaxies*

(18 December, 2024) **Nordita and Astronomy seminar** (Stockholm, Sweden)
Invited seminar: *Galaxy simulations with individual stars & the formation of the smallest galaxies*

(19 September, 2024) **CfA ITC colloquium** (Boston, US)
Colloquium: *Galaxy simulations with individual stars & the formation of the smallest galaxies*

(13 August, 2024) **Star formation workshop** (Hamilton, Canada)
Invited talk: *Galaxy simulations with individual stars & the formation of the smallest galaxies*

(11 June, 2024) **Workshop on clouds, star clusters and black holes** (Alpbach, Austria)
Contributed talk: *Star cluster formation in star-by-star simulations of dwarf galaxies*

(7 May, 2024) **ESO Seminar** (Santiago, Chile)
Invited seminar: *Dwarf galaxy simulations resolving all visible stars across a Hubble time*

(24 April, 2024) **RAMSES user meeting** (New York, USA)
Contributed talk: *Star-by-star simulations of dwarf galaxies in cosmological environments*

(1 March, 2024) **Strasbourg astronomical observatory** (France)
Colloquium: *The galactic scale impact of individual stars*

(28 February, 2024) **Building Galaxies from scratch** (Vienna, Austria)
Contributed talk: *Star-by-star simulations of dwarf galaxies in cosmological environments*

(5 July, 2023) **A multi-wavelength view on globular clusters near and far** (Sexten, Italy)
Contributed talk: *The influence of feedback on the stars cluster mass function*

(29 June, 2023) **Phases of Galactic Evolution** (Sexten, Italy)
Invited talk: *The evolution and mixing of chemical elements in galaxies simulated star-by-star*

(19 April, 2023) **RAMSES user meeting** (Oxford, UK)
Contributed talk: *INFERNO: A star-by-star model including feedback, enrichment, and realistic natal velocities in RAMSES*

(30 May, 2022) **University Of Surrey** (Guildford, UK)
Invited seminar: *Resolved stars in galaxy simulations*

(25 March, 2022) **Abundance gradients to trace galaxy formation and evolution** (Sexten, Italy)
Invited talk: *Chemical evolution and abundance gradients in hydrodynamic simulations*

(29 September, 2021) **RAMSES user meeting** (virtual)
Contributed talk: *Ramses simulations with resolved stars*

(3 October, 2019) **RAMSES user meeting** (Copenhagen)
Contributed talk: *Simulating individual star in RAMSES*

(5 August, 2019) **Santa Cruz Galaxy Workshop** (CA, US)
Contributed talk: *Understanding galaxy formation star by star*

(19 November, 2018) **Survival of Dense Star Clusters in the MW System** (MPIA, Heidelberg)
Contributed talk: *Tidal stripping as a mechanism for placing globular clusters on wide orbs*

Student supervision

(2024-2025) Supervision of graduate student Sally Jiang (AMNH/Columbia)

(2024-2025) Supervision of Luanna Veroneze Quinalha as summer student (Barnard SRI program, NYC) and as research intern (AMNH)

(2023) Supervision of summer student Madeline Maldonado Gutierrez (Barnard SRI program, NYC)

(2021) Supervision of summer student Elin Sandvik (MSc level)

(2019) Assisting supervision of MSc student Mateo Prgomet (*MNRAS paper*)

Teaching

Lund University

(2021) Training in teaching and learning in higher education (Lund university course)

(2018-2022) Lecturing, lab development and supervision in Galaxies and Cosmology course (BSc)

(2018-2022) Supervising observational exercise in Introduction to Astrophysics course (BSc)

(2018-2020) Tutoring in Stellar Structure and Evolution course (MSc)

(2019) Tutoring in High Energy Astrophysics course (MSc)

(2018) Supervising remote radio-telescope observations in Galaxies and Cosmology course (BSc)

Grants/Funding

(2024) **NSF AAG-2023**
The origin of ultra-faint dwarf galaxies and their globular clusters (award declined)

(2024) **NASA ROSES-2023 Astrophysics Theory Program (grant 80NSSC24K0935)**
The origin of ultra-faint dwarf galaxies and their globular clusters, 670K USD

(2020) **Royal Physiographic Society in Lund**
Evolving galaxies star-by-star, 105K SEK (12K USD)

(2018) **Royal Physiographic Society in Lund**
Investigating the impact of runaway stars, 50K SEK (6K USD)

Notable collaborations

(2023-now) **Torch**; Couple gas and direct N-body for star cluster formation
- Roles: *Code developer, Leader of a science project*

(2021-now) **EDGE2**; Resolving light & dark in isolated dwarfs
- Roles: *Key code developer, Leader of a science project, Member of management group*

Computer allocations

(2024) **Co-I of NSF ACCESS allocation**
(Next Generation Star Cluster Formation Modeling), 6.1 million CPU hours

(2024) **PI of NASA HEC allocation**
Awared with NASA grant 80NSSC24K0935), 21 million CPU hours

(2021) **Co-I of DiRAC allocation** (EDGE3.0: From first light to massive black hole seeds), 170 million CPU hours, PI: Justin Read

(2021) **Co-I of EuroHPC allocation** (LUMI pilot phase), 150 million CPU hours, PI:Oscar Agertz

(2016-2021) **Co-I of 11 national allocations** (SNIC), 215K CPU hours/month, Lunarc-*Aurora*) & Linköping (NCS-*Tetralith*).

(2020) **Co-I of a PRACE allocation**, 45 million CPU hours, PI:Oscar Agertz

Press

(2020) Runaway stars explaining mysterious FUV light
Press coverage by national and international media e.g. Science News, Lund University news, Expressen & Skanska Dagbladet.

Leadership & Outreach

(2023 – 2025) **Seminar committee** at AMNH

(2024) **SOC/LOC for RAMSES User Meeting at the Flatiron Institute**

(2024) **LOC for AMUSE workshop at the AMNH**

(2021) **Management group of EDGE2.0**, International collaboration, Member

(2021) **Department board**, Lund University, PhD representative

(2018 – 2022) **Board of undergraduate education**, Lund University.

(2018 – 2022) **Telescope responsible**, Lund University.

(2020) **PhD student Council, Lund University**, Chair and main organiser

(2019) **Galaxy formation meetings (GalForm)**, Lund University, Chair and main organiser.

(2017 – 2018) **ALVA, Local public outreach organization**, Lund University.
President (2017-2018) & Vice president (2016-2017).

(2017) **Lund planetarium**, Lund Observatory. Host of planetarium shows.

(2017) **LOC for the 4-MOST DFDR consortium**, Lund University.

(2017) **LOC for the Knut & Alice Wallenberg foundation 2017 symposium** Lund University.

References

1. Prof. Mordecai-Mark Mac Low
American Museum of Natural History, Research advisor, mordecai@amnh.org

2. Dr. Oscar Agertz
Lund Observatory, Primary PhD supervisor, oscar.agertz@astro.lu.se

3. Prof. Romain Teyssier
Princeton University, close collaborator, teyssier@princeton.edu

4. Dr. Florent Renaud
University of Strasbourg, PhD supervisor, florent.renaud@astro.unistra.fr

List of publications

Refereed first author publications

EDGE-INFERNO: Simulating Every Observable Star in Faint Dwarf Galaxies and Their Consequences for Resolved-star Photometric Surveys
Andersson, E. P., Rey, M. P., Pontzen, A., Cadiou, C., Agertz, O., Read, J. I., & Martin, N. F., ApJ, 978, 129, 2025

Pre-supernova feedback sets the star cluster mass function to a power law and reduces the cluster formation efficiency
Andersson, E. P., Mac Low, M.-M., Agertz, O., Renaud, F., & Li, H., A&A, 681, A28, 2024

INFERNO: Galactic winds in dwarf galaxies with star-by-star simulations including runaway stars
Andersson, E. P., Agertz, O., Renaud, F., & Teyssier, R., MNRAS, 521, 2196, 2023

Runaway stars masquerading as star formation in galactic outskirts
Andersson, E. P., Renaud, F., & Agertz, O., MNRAS, 502, L29, 2021

How runaway stars boost galactic outflows
Andersson, E. P., Agertz, O., & Renaud, F., MNRAS, 494, 3328, 2020

Tidal stripping as a mechanism for placing globular clusters on wide orbits: the case of MGC1 in M31
Andersson, E. P., & Davies, M. B., MNRAS, 485, 4134, 2019

Refereed co-authored publications

EDGE: the emergence of dwarf galaxy scaling relations from cosmological radiation-hydrodynamics simulations
Rey, M. P., Taylor, E., Gray, E. I., Kim, S. Y., **Andersson, E. P.**, Pontzen, A., Agertz, O., Read, J. I., Cadiou, C., Yates, R. M., Orkney, M. D. A., Scholte, D., Saintonge, A., Breneman, J., McQuinn, K. B. W., Muni, C., & Das, P., MNRAS, 541, 1195, 2025

SIEGE: III. The formation of dense stellar clusters in sub-parsec resolution cosmological simulations with individual star feedback
Calura, F., Pascale, R., Agertz, O., **Andersson, E. P.**, Lacchin, E., Lupi, A., Meneghetti, M., Nipoti, C., Ragagnin, A., Rosdahl, J., Vanzella, E., Vesperini, E., & Zanella, A., A&A, 698, A207, 2025

Massive star cluster formation: III. Early mass segregation during cluster assembly
Polak, B., Mac Low, M.-M., Klessen, R. S., Portegies Zwart, S., **Andersson, E. P.**, Appel, S. M., Cournoyer-Cloutier, C., Glover, S. C. O., & McMillan, S. L. W., A&A, 695, A188, 2025

EDGE: a new model for nuclear star cluster formation in dwarf galaxies
Gray, E. I., Read, J. I., Taylor, E., Orkney, M. D. A., Rey, M. P., Yates, R. M., Kim, S. Y., Noël, N. E. D., Agertz, O., **Andersson, E. P.**, & Pontzen, A., MNRAS, 539, 1167, 2025

AEOS: Star-by-star Cosmological Simulations of Early Chemical Enrichment and Galaxy Formation
Brauer, K., Emerick, A., Mead, J., Ji, A. P., Wise, J. H., Bryan, G. L., Mac Low, M.-M., Côté, B., **Andersson, E. P.**, & Frebel, A., ApJ, 980, 41, 2025

AEOS: Transport of Metals from Minihalos following Population III Stellar Feedback
Mead, J., Brauer, K., Bryan, G. L., Mac Low, M.-M., Ji, A. P., Wise, J. H., Emerick, A., **Andersson, E. P.**, Frebel, A., & Côté, B., ApJ, 980, 62, 2025

Massive Star Cluster Formation with Binaries. I. Evolution of Binary Populations
Cournoyer-Cloutier, C., Sills, A., Harris, W. E., Polak, B., Rieder, S., **Andersson, E. P.**, Appel, S. M., Mac Low, M.-M., McMillan, S., & Portegies Zwart, S., ApJ, 977, 203, 2024

Massive star cluster formation: II. Runaway stars as fossils of subcluster mergers
Polak, B., Mac Low, M.-M., Klessen, R. S., Portegies Zwart, S., **Andersson, E. P.**, Appel, S. M., Cournoyer-Cloutier, C., Glover, S. C. O., & McMillan, S. L. W., A&A, 690, A207, 2024

Massive star cluster formation: I. High star formation efficiency while resolving feedback of individual stars
Polak, B., Mac Low, M.-M., Klessen, R. S., Wei Teh, J., Cournoyer-Cloutier, C., **Andersson, E. P.**, Appel, S. M., Tran, A., Lewis, S. C., Wilhelm, M. J. C., Portegies Zwart, S., Glover, S. C. O., Rieder, S., Wang, L., & McMillan, S. L. W., A&A, 690, A94, 2024

Measuring Dwarf Galaxy Intrinsic Abundance Scatter with Mid-resolution Spectroscopic Surveys: Calibrating APOGEE Abundance Errors
Mead, J., Ness, M., **Andersson, E.**, Griffith, E. J., & Horta, D., ApJ, 974, 186, 2024

EDGE: The direct link between mass growth history and the extended stellar haloes of the faintest dwarf galaxies
Goater, A., Read, J. I., Noël, N. E. D., Orkney, M. D. A., Kim, S. Y., Rey, M. P., **Andersson, E. P.**, Agertz, O., Pontzen, A., Vieliute, R., Kataria, D., & Jeneway, K., MNRAS, 527, 2403, 2024

Emergence and cosmic evolution of the Kennicutt-Schmidt relation driven by interstellar turbulence
Kraljic, K., Renaud, F., Dubois, Y., Pichon, C., Agertz, O., **Andersson, E.**, Devriendt, J., Freundlich, J., Kaviraj, S., Kimm, T., Martin, G., Peirani, S., Segovia Otero, Á., Volonteri, M., & Yi, S. K., A&A, 682, A50, 2024

EDGE: The sensitivity of ultra-faint dwarfs to a metallicity-dependent initial mass function
Prgomet, M., Rey, M. P., **Andersson, E. P.**, Segovia Otero, A., Agertz, O., Renaud, F., Pontzen, A., & Read, J. I., MNRAS, 513, 2326, 2022

VINTERGATAN III: how to reset the metallicity of the Milky Way
Renaud, F., Agertz, O., **Andersson, E. P.**, Read, J. I., Ryde, N., Bensby, T., Rey, M. P., & Feuillet, D. K., MNRAS, 503, 5868, 2021

VINTERGATAN - II. The history of the Milky Way told by its mergers
Renaud, F., Agertz, O., Read, J. I., Ryde, N., **Andersson, E. P.**, Bensby, T., Rey, M. P., & Feuillet, D. K., MNRAS, 503, 5846, 2021

VINTERGATAN - I. The origins of chemically, kinematically, and structurally distinct discs in a simulated Milky Way-mass galaxy
Agertz, O., Renaud, F., Feltzing, S., Read, J. I., Ryde, N., **Andersson, E. P.**, Rey, M. P., Bensby, T., & Feuillet, D. K., MNRAS, 503, 5826, 2021

Refereed conference proceedings

Models in shaping of Milky Way gradients
Palla, M., Spitoni, E., & **Andersson, E.**, Mem. Soc. Astron. Italiana, 93, 9, 2022

Papers in review

FEAST: JWST uncovers the emerging timescales of young star clusters in M83
Knutas, A., Adamo, A., Pedrini, A., Linden, S. T., Bajaj, V., Ryon, J. E., Gregg, B., Ali, A. A., **Andersson, E. P.**, Bik, A., Bortolini, G., Buckner, A. S. M., Calzetti, D., Duarte-Cabral, A., Elmegreen, B. G., Faustino Vieira, H., Gallagher, J. S., Grasha, K., Johnson, K., Lai, T. S.-Y., Lapeer, D., Messa, M., Östlin, G., Sabbi, E., Smith, L. J., & Tosi, M., arXiv e-prints, arXiv:2505.08874, 2025

Massive Interacting Binaries Enhance Feedback in Star-Forming Regions
Cournoyer-Cloutier, C., **Andersson, E. P.**, Appel, S. M., Lahén, N., Polak, B., Rantala, A., Toonen, S., Sills, A., Rieder, S., Portegies Zwart, S., Mac Low, M.-M., & Harris, W. E., arXiv e-prints, arXiv:2507.02780, 2025

Aeos: The Impact of Pop III Initial Mass Function and Star-by-Star Models in Galaxy Simulations
Brauer, K., Mead, J., Wise, J. H., Bryan, G. L., Mac Low, M.-M., Ji, A. P., Emerick, A., **Andersson, E. P.**, Frebel, A., & Côté, B., arXiv e-prints, arXiv:2502.20433, 2025

PRISM: A Non-Equilibrium, Multiphase Interstellar Medium Model for Radiation Hydrodynamics Simulations of Galaxies
Katz, H., Liu, S., Kimm, T., Rey, M. P., **Andersson, E. P.**, Cameron, A. J., Rodriguez-Montero, F., Agertz, O., Devriendt, J., & Slyz, A., arXiv e-prints, arXiv:2211.04626, 2022