

## Dr. Marcel R. Haas - Astrophysicist turned data scientist

On this planet since 1983, now in Leiderdorp (NL). [mail@marcelhaas.com](mailto:mail@marcelhaas.com)

*I am a passionate and investigative (data) scientist who loves a great puzzle. I enjoy using my technical skills to help people and organizations make sense of their world. I look at the bigger picture while keeping a keen eye on important details and enjoy working in a socially relevant environment.*



## Professional Experience

### Data Science

Based on sensor data and deep as well as reinforcement learning we develop a control model to minimize energy use and nitrogen emission from a Waste Water Treatment Plant that serves a million customers of [Waternet](#). We also predict objections to tax assessments, developed soft sensors and built data-driven solutions for many different stakeholders, all in the Azure Cloud.



As senior data science consultant at [ORTEC](#) (2019-2020) I coached people at customers in technical roles (often data scientists) and I advised companies strategically in their digital and data driven transformations at all levels in the organization. I also built and deployed machine learning and AI solutions for a wide variety of applications in financial services, retail and energy industries.



At [DSW Zorgverzekeraar](#) (2013-2019), I established DataLab and was responsible for that team of four, using advanced analytics, machine learning, and data visualization for a broad variety of business problems (e.g. customer journeys and satisfaction, churn, risk and IT performance). I had a leading role in the transition towards graphics based reporting, in a project predicting dementia and in a large hybrid fraud detection model that used machine learning to catch fraudulent care providers across a large range of healthcare domains (primary, mental, dental, paramedical and revalidation care).



### Teaching

As a freelancer and for [The Analytics Academy](#) (joint venture between ORTEC and the University of Amsterdam) I develop and teach courses on analytics related topics, for both hard and soft skills, to a wide range of companies and at a range of skill levels (introductory to graduate level), in target audiences from management to analytics translators and data scientists.



I taught several guest lectures at The Johns Hopkins University ('Numerical Methods in Physics', 400 level) and was a TA for several (astro-) physics BSc and MSc courses in Leiden and Utrecht. From 2004 to 2006 I taught physics to HAVO 4&5 students at NOVA College Amstelveen.

### Scientific research in astrophysics numerical simulations of galaxy formation

After graduating from my PhD at [Leiden](#) in 2010, I did three years of postdoctoral research positions in the USA. At [Space Telescope Science Institute](#), we developed software for the first ever mock Hubble Space Telescope observations from the supercomputer simulations that I analyzed in my thesis. I led the team of 6 (including 2 graduate students) in our efforts to model astrophysical sources, the telescope and instrument and the methods observers would use on real data. At [Rutgers University](#), I modeled the observational process for a future large radio telescope to create mock observations. My proposal won funding for two undergraduate students to work with me on the analysis of hydrodynamical supercomputer simulations of galaxy formation.



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## Education

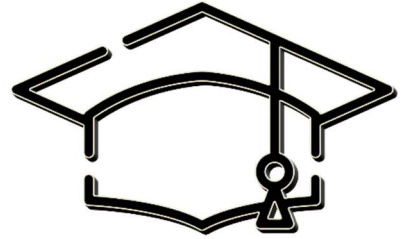
**2010:** PhD in Astrophysics, Leiden Observatory, Leiden University (advisors: dr. Joop Schaye and prof. dr. Marijn Franx), on a thesis titled 'Nature and Nurture in Galaxy Formation Simulations'.

**2006:** Master of Science Astrophysics ("cum Laude"), Utrecht University (supervisor: prof. dr. Henny Lamers), thesis: 'Star clusters in their host galaxies'.

**2004:** Bachelor of Science Physics and Astronomy ("with honors"), Utrecht University, thesis: 'Magnetic straws in the solar atmosphere'

**2001:** Gymnasium (grammar school, science major), Alberdingk Thijm College, Hilversum.

**Other topics:** Cloud computing on Azure, Heuristics in mathematical optimization, process mining, Deep Learning with SAS, Data mining and visualization, Economic principles for scientists, Software Carpentry, Advanced Python Mastery (by David Beazley), Introduction to artificial intelligence, Intercultural communication, Giving scientific and technical presentations.



## Other

**2019 - present:** [NumFOCUS](#) Small Development Grants selection committee.

**2019:** Bid4Best Marie Curie Innovative Training network co-I (€3.5M), part of Horizon2020 scheme of the EU.

**2018 – present:** Member of DeepSkies Lab to foster collaboration between astrophysicists and machine learners (reviewing code and papers, open discussion).

**Before 2015:** National Academy of Sciences (US), member of panel "On the State of the Postdoctoral Experience for Scientists and Engineers - Revisited". As postdoc representative in a committee at STScI, we designed and implemented a formal mentoring system. I co-organized the Dutch Astronomers Conference and was in a task force for the International Year of Astronomy. For 10 years, I was board member (including chair and treasurer positions) of amateur astronomy organizations in the Netherlands ([JWG](#) and [KNVWS](#)). I organized the first Dutch Astronomy Olympiad for high school students (worth the 2007 Kaiser Prize for astronomy popularization) and co-organized the EAAE summer school for high school science teachers.

## Skills

**Operating systems:** Linux/UNIX, Windows, MacOS

**Daily use:** Python (including many data science and visualization packages), SAS (and various related packages), MS Office 365, SQL, Version control (git)

**Experienced with** Shell scripting, PowerBI, Azure, AWS, GCP, R, NoSQL

**Basic knowledge:** C/C++, MPI, IDL, HTML/css, Fortran 77/90/95

**Other languages:** Dutch (mother tongue), English (fluent)



## Private

I am the proud father of two lovely children: Amy (2012) and Oscar (2015). I enjoy puzzles, the boardgame Go (or Baduk if you prefer Korean) and keep myself up to date on the current state of affairs in the astrophysics community. With colleagues in the UK, I do a research project on galaxies that are dying quickly. I am an aficionado (dare I say snob?) of craft beer and I enjoy riding my motorcycle.

## Scientific Publications

### Refereed, first author

1. Marcel R. Haas, Joop Schaye, C.M. Booth, Claudio Dalla Vecchia, Volker Springel, Tom Theuns, Robert P.C. Wiersma, 2013, MNRAS, 435, 2955, *Physical properties of simulated galaxy populations at  $z=2$  II. Effects of physics ingredients other than cooling and outflows*
2. Marcel R. Haas, Joop Schaye, C.M. Booth, Claudio Dalla Vecchia, Volker Springel, Tom Theuns, Robert P.C. Wiersma, 2013, MNRAS, 435, 2931, *Physical properties of simulated galaxy populations at  $z=2$  I. Effect of metal-line cooling and feedback from star formation and AGN*
3. Marcel R. Haas, Joop Schaye, Akila Jeesson-Daniel, MNRAS, 2012, 419, 2133, *Disentangling galaxy environment and host halo mass*
4. M.R. Haas, P. Anders, 2010, A&A, 512, 79, *Variations in integrated galactic initial mass functions due to sampling method and cluster mass function*
5. M.R. Haas, M. Gieles, R.A. Scheepmaker, S.S. Larsen, H.J.G.L.M. Lamers, 2008, A&A, 487, 937, *ACS imaging of star clusters in M51. II. The luminosity function and mass function across the disk*

### Refereed, co-author

6. Zachary Dugan, Sarah Bryan, Volker Gaibler, Joseph Silk, Marcel Haas, 2014, ApJ, 796, 113, *Stellar signatures of AGN jet triggered star formation*
7. Michael Berry, Rachel S. Somerville, Marcel R. Haas, Eric Gawiser, Ari Maller, Gergo Popping, S.C. Trager, 2014, MNRAS, 441, 939, *Damped Ly-alpha absorption systems in Semi-Analytic Models with multi-phase gas*
8. Joseph Silk, Vincenzo Antonuccio-Delogu, Yohan Dubois, Volker Gaibler, Marcel R. Haas, Sadegh Khochfar, Martin Krause, A&A Letters, 545, L11, *Jet interactions with a giant molecular cloud in the Galactic centre and ejection of hypervelocity stars*
9. Akila Jeesson-Daniel, Claudio Dalla Vecchia, Marcel R. Haas, Joop Schaye, 2011, MNRAS Letters, 415L, 69, *The correlation structure of dark matter halo properties*
10. Freeke van de Voort, Joop Schaye, C.M. Booth, Marcel R. Haas, Claudio Dalla Vecchia, MNRAS, 2011, 414, 2458, *The rates and modes of gas accretion on to galaxies and their gaseous haloes*
11. Joop Schaye, Claudio Dalla Vecchia, C.M. Booth, Robert P.C. Wiersma, Tom Theuns, Marcel R. Haas, Serena Bertone, Alan R. Du\_y, I.G. McCarthy, Luca Tornatore, Freeke van de Voort, 2010, MNRAS, 402, 1536, *The physics driving the cosmic star formation history*
12. Laura V. Sales, Julio F. Navarro, Joop Schaye, Claudio Dalla Vecchia, Volker Springel, Marcel R. Haas, Amina Helmi, 2009, MNRAS Letters, 399, L64, *The origin of extended disk galaxies at  $z=2$*
13. R.A. Scheepmaker, M.R. Haas, M.Gieles, N.Bastian, S.S. Larsen, H.J.G.L.M. Lamers, 2007, A&A, 469, 925, *ACS imaging of star clusters in M51. I. Identification and radius distribution*
14. M. Gieles, S.S. Larsen, R.A. Scheepmaker, N. Bastian, M.R. Haas, H.J.G.L.M. Lamers, 2006, A&A Letters, 446, L9-L12, *Observational evidence for a truncation of the star cluster initial mass function at the high mass end*

### Other

15. Muna, D. and 154 co-authors, ArXiv, 2016, *The Astropy problem*
16. M.R.Haas, P. Anders, 2009, *Galactic consequences of clustered star formation, in Star clusters - Basic Galactic Building Blocks Throughout Time And Space (IAU S266)*
17. M.R.Haas, P. Anders, 2009, *Population synthesis from clustered star formation, in Population synthesis planning for the next decade (IAU S262)*
18. M.R. Haas, M. Gieles, R.A. Scheepmaker, S.S. Larsen, H.J.G.L.M. Lamers, N. Bastian, 2008, *Variation of the cluster luminosity function across the disk of M51, in Mass loss from stars and the evolution of stellar clusters*
19. R.A. Scheepmaker, M. Gieles, M.R. Haas, N. Bastian, H.J.G.L.M. Lamers, 2008, *Thousands of Star Clusters in M51 with HST/ACS, in Mass loss from stars and the evolution of stellar clusters*
20. R.A. Scheepmaker, M. Gieles, M.R. Haas, N. Bastian, S.S. Larsen, H.J.G.L.M. Lamers, 2006, *The radii of thousands of star clusters in M51 with HST/ACS, in Globular Clusters: Guides to Galaxies*
21. M. Gieles, S.S. Larsen, M.R. Haas, R.A. Scheepmaker, N. Bastian, 2006, *The Maximum Mass of Star Clusters, in Globular Clusters Guides to Galaxies*