

Tjitske Starkenburg

Center for Interdisciplinary Exploration and Research in Astrophysics (CIERA)
Northwestern University
1800 Sherman Ave – Evanston, IL 60201 – USA

tjitske.starkenburg@northwestern.edu • <https://tstarkenburg.github.io>

Academic biography

Postdoctoral Fellow Center for Interdisciplinary Exploration and Research in Astrophysics	Northwestern University Dec 2019–
Flatiron Research Fellow Center for Computational Astrophysics	Flatiron Institute 2016–Dec 2019
PhD Astronomy June 24 2016, <i>The impact of dark satellites on dwarf galaxies in a ΛCDM universe</i> Advisor: Prof. Dr. A. Helmi	University of Groningen 2011–2016
MSc Astronomy, Cum Laude ~ top 5–10% Master thesis: <i>On dwarf galaxies and dark satellites</i> Advisor: Prof. Dr. A. Helmi	University of Groningen 2009–2011
BSc Astronomy & BSc Mathematics Bachelor thesis: <i>Classifying galaxies with mathematical morphology</i> Advisors: Prof. Dr. S.C. Trager (astronomy), Dr. M.H.F. Wilkinson (computer science) & Prof. Dr. G. Vegter (mathematics)	University of Groningen 2005–2009

Interests

I am interested in **(dwarf) galaxy formation and evolution**, and particularly in improving techniques to **build synthetic observations** from theoretical models, and in applying **statistical and machine learning tools** to facilitate **apples-to-apples comparisons of simulated and observed galaxies**. Through combining information from dynamics, kinematics, morphology, and stellar populations, for the full populations of galaxies, I aim to understand how galaxies evolve under influence of the non-linear combination of all internal and external physical processes.

Prizes and grants

Multiple travel grants	Leids Kerkhoven-Bosscha Fund 2011–2016
National Academic Award <i>for the Kapteyn Institute Team on The infrared universe</i> <ul style="list-style-type: none">National award for the best science outreach project with national scope: €100,000 to implement the proposed projectI was an active member of the team and contributed to the winning presentation	Netherlands Organisation for Scientific Research 2008
"Betabeurs" Scholarship <i>Scholarship for top students in Mathematics, cohorts starting 2004 and 2005</i> Amount: €1,500	Dutch Ministry for Science and Education 2007
Prize in Mathematics <i>2nd Prize for presenting my own research project</i> Out of a selection of >100 high school students from 14 different countries	International Conference for Young Scientists 2005
Jan Kommandeur's prize <i>3rd Prize in a competition for the best high school research project of the Netherlands</i>	University of Groningen 2005

Managerial experience

PI of the IQ (Isolated and Quiescent galaxies)-collaboratory <i>collaboration of ~30 astronomers, with currently 3 active multi-paper projects</i> comparing simulated and observed galaxy populations to learn about quenching processes	IQ-collaboratory 2017–current
Co-leader of the synthetic observations working group <i>the SMAUG (Simulating Multiscale Astrophysics to Understand Galaxies) collaboration</i> ~40 experts from 7 institutions in the USA and Europe	SMAUG 2017–current

CIERA Social Justice efforts Bridge-Programs and Student Retention Task Force	CIERA
<i>Task force researching best practices to serve and retain students from underrepresented groups</i>	2020-current
CIERA/Northwestern University Astrophysics Seminar Organizing Committee	CIERA
<i>Organizing 20 virtual astrophysics seminars during the academic year</i>	2020-current
<i>includes devising the best ways to organize 'virtual visits' or informal meetings between speakers and CIERA members</i>	
Organizing the Tristate Postdoc Retreat 2018	Flatiron Institute
<i>2-day career oriented workshop for all astronomy postdocs within the wider New York area</i>	2018
<i>Independently thought out and planned the program, including workshops, Decadal Survey brainstorm sessions, panel discussions, and lightning talks</i>	
Co-organizing astro-ph meetings at the Center for Computational Astrophysics	Flatiron Institute
	2018
Chair, Organizing Committee Study Trip	Student association for Physics and Mathematics
<i>Organizing a three-week study trip</i>	2008–2009
<ul style="list-style-type: none"> o visiting Universities, Institutes, and Companies in Brazil and Argentina o for 25 students and 2 staff members of the University of Groningen; Total budget: €70,000 	
Vice-Chair, Faculty Council, Faculty of Mathematics and Natural Sciences	University of Groningen
<i>The Council is the official representative advisory body to the Executive Board of the Faculty</i>	2007

Teaching and mentoring experience and training

CIRTL online course <i>An Introduction to Evidence-Based Undergraduate STEM Teaching</i>	CIRTL
<i>Also participated a Learning Community connected to the course.</i>	2020
<i>Course including developing learning goals and objectives, and teaching plans for a fictitious class of a course of choice.</i>	
Mentoring graduate student in the Kavli Summer School 2018	Flatiron Institute
<i>co-mentor during a 6-week project on outside-in quenching galaxies</i>	2018
<i>(Starkenburg, Tonnesen & Kopenhafer, 2019; Kopenhafer, Starkenburg & Tonnesen, 2020)</i>	
Math tutoring for Public School children with <i>The Reading Team Math Program</i>	New York
<i>led by Prof. Dr. Hui from Columbia University</i>	2017
Mentoring CUNY undergrad Summer student	Flatiron Institute
<i>Project on black holes in dwarf galaxy mergers co-mentor Prof. Dr. Jillian Bellovary</i>	2017
<i>The student has presented results at SACNAS and AAS meetings (Mercedes-Feliz, Starkenburg & Bellovary in prep.)</i>	
Teaching Assistant	University of Groningen
<i>For a number of courses on <i>Introductory Astronomy and Observational Astronomy</i></i>	2010–2013
<i>Including teaching exercise classes, and mentoring students during observation runs at the Isaac Newton Telescope (INT), La Palma, Spain, and the Blauw Observatory, University of Groningen, the Netherlands</i>	
Mentoring high school students in research projects	University of Groningen
<i>Including varying science outreach activities and masterclasses</i>	2007–2011

Publication list

First and Second author publications.....

* indicates works by students I co-supervised

Dickey, C.M., **Starkenburg, T.K.**, Geha, M., and the IQ-(Isolated and Quiescent) collaborative, *IQ-Collaboratory II: The Quiescent Fraction of Isolated, Low Mass Galaxies Across Simulations and Observations*, 2020, Accepted to ApJ

*Kopenhafer, C., **Starkenburg, T.K.**, Tonnesen, S., and Tuttle, S., *The breakBRD Breakdown: Using IllustrisTNG to Track the Quenching of an Observationally-Motivated Sample of Centrally Star-Forming Galaxies*, 2020, ApJ, 903, 143

Duckworth, C.J., **Starkenburg, T.K.**, Genel, S., Davis, T., Habouzit, M., Kraljic, K., Tojeiro, R., *Decoupling the rotation of stars and gas – II: the link between black hole activity and IFU kinematics in IllustrisTNG*, 2020, MNRAS, 495, 4542

Pearson, S., **Starkenburg, T.K.**, Johnston, K.V.J., Williams, B.F., Ibata, R.A., and Khan, R., *Detecting Thin Stellar Streams in External Galaxies: Resolved Stars & Integrated Light*, 2019, ApJ, 883, 87

Starkenburg, T.K., Sales, L.V., Genel, S., Manzano-King, C., Canalizo G., and Hernquist, L., *On the Origin of Star-Gas Counterrotation in Low-mass Galaxies*, 2019, ApJ, 878, 143

Starkenburg, T.K., Tonnesen, S., and Kopenhafer, C., *What Is Inside Matters: Simulated Green Valley Galaxies Have Centrally Concentrated Star Formation*, 2019, ApJL, 874, L17

Hahn, C.H., **Starkenburger, T.K.**, and the IQ-(Isolated and Quiescent) collaboratory, *IQ-Collaboratory 1.1: the Star-Forming Sequence of Simulated Central Galaxies*, 2019, ApJ, 872, 160

Starkenburger, T.K., Helmi, A. and Sales, L.V., *Dark influences III. Structural characterization of minor mergers of dwarf galaxies with dark satellites*, 2016, Astronomy & Astrophysics, 595, A56

Starkenburger, T.K., Helmi, A. and Sales, L.V., *Dark Influences II: gas and star formation in minor mergers of dwarf galaxies with dark satellites*, 2016, Astronomy & Astrophysics, 587, A24

Starkenburger, T.K. and Helmi, A., 2015, *Dark Influences: imprints of dark satellites on dwarf galaxies*, 2015, Astronomy & Astrophysics, 575, A59

Co-Authored publications.....

Flores Velázquez, J.A., Gurvich, A.B., Faucher-Giguère, C-A, Bullock, J.S., **Starkenburger, T.K.**, et al., *The time-scales probed by star formation rate indicators for realistic, bursty star formation histories from the FIRE simulations*, submitted to MNRAS

Iyer, K.G., Tacchella, S., Genel, S., et al. including **Starkenburger, T.K.**, *The diversity and variability of star formation histories in models of galaxy evolution*, 2020, MNRAS, 498, 430

Pandya, V., Somerville R.S., Anglés-Alcázar, D., et al. including **Starkenburger, T.K.**, *First results from SMAUG: The need for preventative stellar feedback and improved baryon cycling in semi-analytic models of galaxy formation*, Accepted to ApJ

Koppelman, H.H., Helmi, A., Massari, D., Price-Whelan, A.M., and **Starkenburger, T.K.**, *Multiple retrograde substructures in the Galactic halo: A shattered view of Galactic history*, 2019, A&A, 631, L9

Arabsalmani, M., Roychowdhury, S., **Starkenburger, T.K.**, et al., *The host galaxy of GRB 980425 / SN1998bw is interacting with a satellite galaxy*, 2019, MNRAS, 485, 5411

Helmi, A., Sales, L.V., Starkenburger, E., **Starkenburger, T.K.**, Vera-Ciro, C.A., De Lucia, G., Li, Y.-S., *Dark Satellites and the Morphology of Dwarf Galaxies*, 2012, Astrophysical Journal, 758L, 5

Scientific experience

Selected Talks at Conferences.....

- *Linking the Galactic and the Extragalactic*, virtual, ASTRO-3D, December 2020
- *The Epoch of Galaxy Quenching*, virtual, KICC, September 2020
- *Quenching and Transformation Throughout Cosmic Time*, Aspen Center for Physics, February 2020
- *In the Balance: Stasis and Disequilibrium in the Milky Way*, KITP Santa Barbara, April 2019, **Invited talk**
- *The life and death of star-forming galaxies*, ICRAR, Perth, Australia, March 2019, Contributed talk
- *The Near, The Far, and The In-between: Synergy between low and high redshift galaxy evolution studies in the era of JWST and EUCLID*, Noordwijk, the Netherlands, July 2018
- *The Physics of Galaxy Scaling Relations and the Nature of Dark Matter*, Kingston, Canada, July 2018
- *KIAA Forum on Gas in Galaxies: star formation and quenching*, Beijing, China, June 2018
- *The Physics of quenching massive galaxies at high redshift*, Leiden, the Netherlands, November 2017
- *The role of gas in galaxy dynamics*, Malta, October 2017
- *Gaia sprint NYC workshop*, New York, USA, October 2016 and June 2018
- *Dark matter on smallest scales*, Leiden, the Netherlands, April 2016
- *13th Potsdam Thinkshop: Near field cosmology*, Obergurgl, Austria, March 2016
- *European Week of Astronomy and Space Science: The journey of dwarf galaxies*, Tenerife, Spain, June 2015
- *The life and death of satellite galaxies*, Leiden, the Netherlands, April 2015
- *11th Potsdam Thinkshop: Satellite galaxies and dwarfs in the Local Group*, Potsdam, Germany, August 2014

Selected Seminar Talks.....

- Michigan State University astrophysics group, **Invited Seminar**, December 2020
- American Museum of Natural History Seminar, May 2019
- Canadian Institute for Theoretical Astrophysics, **Invited Seminar**, May 2019

- Institute for Theory and Computation, Center for Astrophysics, Harvard, **Invited Seminar**, March 2019
- Princeton University Galread: galaxy evolution paper discussion Seminar, December 2018
- Space Telescope Science Institute Galaxy Journal Club, November 2018
- Columbia University Thursday Seminar, April 2018
- New York University Astrophysics Seminar, September 2017
- Yale University lunch Seminar, February 2017
- Rutgers University lunch Seminar, February 2017
- University of California Riverside Astronomy Seminar, January 2017
- ESO lunch seminar, May 2016
- MPA Cosmology Seminar, May 2016

Outreach experience

Invited lecture at Amateur Astronomers Inc.	Cranford, New Jersey November 2019
Talk to a scientist at Kids Week 2017 at the Intrepid museum	New York February 2017
Astronomy on Tap (short, interactive outreach talks at a pub) talk and panel discussion	New York November 2016
Invited lectures for amateur astronomers, high school students, specific groups and general public <i>Including a video interview for ScienceLinx, the University of Groningen science outreach center</i>	2011–2016
Lecturer and volunteer at the Blaauw Observatory Open Nights <i>Presenting public lectures, quizzes, and experiments for young audiences, assisting the organization</i>	Groningen 2008–2016
Interview in <i>Zenit</i>, the magazine for astronomy enthusiasts in the Netherlands	September 2015
Evening for Science and Society <i>Meeting that fosters interaction between leading figures in science, industry, politics, and culture</i> Accompanying Amina Helmi, who was invited accompanied by a young scientist of her choice	The Hague October 2015
Invited Talk at the National Conference for Physics Teachers	Noordwijk December 2013
National outreach activities on the <i>Infrared Universe</i> <i>After winning the National Academic Award for best science outreach project with the Kapteyn Institute team</i>	2009