

# CURRICULUM VITAE

Nationality: Indian

Website: [aswinvijayan.github.io](https://aswinvijayan.github.io)

## RESEARCH INTERESTS

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Simulations of galaxy formation and evolution, high-redshift galaxies, dust in galaxies, forward modelling, synergy between simulations and observations.

## WORK EXPERIENCE

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### DAWN Postdoctoral Fellow

15 Oct 2021 – Present

Cosmic Dawn Center, DTU Space, Technical University of Denmark (DTU)

## EDUCATION

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### PhD in Astronomy

30 Sept 2017 – 30 Sept 2021

Astronomy Centre, University of Sussex, United Kingdom

Advisors: Prof. Peter A. Thomas & Dr. Stephen M. Wilkins

Title: The effect of dust in observing galaxies in the early Universe

Defended thesis successfully on 4 October 2021; examiners: Prof. Romeel Davé & Prof. Seb Oliver

### MSc. Research in Astronomy, Cosmology

1 Sept 2015 - 31 July 2017

Sterrewacht Leiden, Universiteit Leiden, The Netherlands

Major Project: Analysing the impact of environment and mergers on halo concentrations, supervisor Dr. Camila A. Correa.

Minor project: A search for serendipitous emission lines in *ALMA* observations of high-redshift galaxies, supervisor Dr. Jacqueline Hodge.

### Bachelor of Technology (B.Tech) in Engineering Physics

1 Aug 2010 - 31 July 2014

National Institute of Technology Calicut (NITC), Kerala, India

Bachelor Thesis: One Dimensional Organic Semiconductor Nanostructures for Solar Cell Fabrication, supervisor Dr. Vari Sivaji Reddy

## FIRST & SECOND AUTHOR PUBLICATIONS

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- 2023 – **Sub-Millimetre Galaxies with Webb: Defining the sub-mm main-sequence.** (In preparation)  
Authors: **Aswin P. Vijayan** & Minju M. Lee, and others
- 2023 – **First Light And Reionisation Epoch Simulations (FLARES) XII: The consequences of star-dust geometry on galaxies in the EoR.** Submitted, MNRAS, [arxiv:2303.04177](https://arxiv.org/abs/2303.04177)  
Authors: **Aswin P. Vijayan**, Peter A. Thomas, and others
- 2022 – **First Light And Reionisation Epoch Simulations (FLARES) VII: The Star Formation and Metal Enrichment Histories of Galaxies in the early Universe.** Published, MNRAS, [arXiv:2208.00976](https://arxiv.org/abs/2208.00976)  
Authors: Stephen M. Wilkins, **Aswin P. Vijayan**, and others
- 2022 – **First Light And Reionisation Epoch Simulations (FLARES) VI: The colour evolution of galaxies  $z=5-15$ .** Published, MNRAS, [arXiv:2207.10920](https://arxiv.org/abs/2207.10920)  
Authors: Stephen M. Wilkins, **Aswin P. Vijayan**, and others
- 2022 – **First Light And Reionisation Epoch Simulations (FLARES) V: The redshift frontier.** Published, MNRAS, [arXiv:2204.09431](https://arxiv.org/abs/2204.09431)  
Authors: Stephen M. Wilkins, **Aswin P. Vijayan**, and others
- 2022 – **First Light And Reionisation Epoch Simulations (FLARES) III: The properties of massive dusty galaxies at cosmic dawn.** Published, MNRAS, [arXiv:2108.00830](https://arxiv.org/abs/2108.00830)  
Authors: **Aswin P. Vijayan**, Stephen M. Wilkins, and others
- 2021 – **First Light And Reionisation Epoch Simulations (FLARES) II: The Photometric Properties of High-Redshift Galaxies.** Published, MNRAS, [arXiv:2008.06057](https://arxiv.org/abs/2008.06057)  
Authors: **Aswin P. Vijayan**, Christopher C. Lovell, and others

8. 2021 – **First Light And Reionisation Epoch Simulations (FLARES) I: Environmental Dependence of High-Redshift Galaxy Evolution.** Published, MNRAS, [arXiv:2004.07283](#)  
Authors: Christopher C. Lovell, **Aswin P. Vijayan**, and others
9. 2019 – **Detailed dust modelling in the L-Galaxies semi-analytic model of galaxy formation.** Published, MNRAS, [arXiv:1904.02196](#)  
Authors: **Aswin P. Vijayan**, Scott J. Clay, Peter A. Thomas, and others

## CO-AUTHORED PUBLICATIONS

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1. 2023 – **DEIMOS spectroscopy of  $z = 6$  protocluster candidate in COSMOS – A massive protocluster embedded in a large scale structure?** Submitted, MNRAS  
Authors: Malte Brinch, Thomas R. Greve and others including **Aswin P. Vijayan**
2. 2023 – **Size - Stellar Mass Relation and Morphology of Quiescent Galaxies at  $z \geq 3$  in Public *JWST* Fields.** Submitted, ApJ  
Authors: Kei Ito, Francesco Valentino, and others including **Aswin P. Vijayan**
3. 2023 – **First Light And Reionisation Epoch Simulations (FLARES) XIV: The Balmer/4000 Å Breaks of Distant Galaxies.** Submitted, MNRAS, [arxiv:2305.18175](#)  
Authors: Stephen M. Wilkins, Christopher C. Lovell, and others including **Aswin P. Vijayan**
4. 2023 – **First Light And Reionisation Epoch Simulations (FLARES) XIII: the Lyman-continuum emission of high-redshift galaxies.** Submitted, MNRAS, [arxiv:2305.18174](#)  
Authors: Louise T. C. Seeyave, Stephen M. Wilkins, and others including **Aswin P. Vijayan**
5. 2023 – **Sub-Millimetre Galaxies with Webb: Near-Infrared Counterparts and Multi-wavelength Morphology.** Published, A&A, [arxiv:2303.17246](#)  
Authors: S. Gillman, B. Gullberg, G. Brammer, **A. Vijayan** and others
6. 2023 – **An Atlas of Color-selected Quiescent Galaxies at  $z > 3$  in Public *JWST* Fields.** Published, ApJ, [arxiv:2302.10936](#)  
Authors: Francesco Valentino, Gabriel Brammer, and others including **Aswin P. Vijayan**
7. 2023 – **First Light And Reionisation Epoch Simulations (FLARES) XI: [OIII] emitting galaxies at  $5 < z < 10$ .** Accepted, MNRAS, [arxiv:2301.13038](#)  
Authors: Stephen M. Wilkins, Christopher C. Lovell, **Aswin P. Vijayan**, and others
8. 2023 – **First Light and Reionisation Epoch Simulations (FLARES) X: Environmental Galaxy Bias and Survey Variance at High Redshift.** Submitted, MNRAS, [arxiv:2301.09510](#)  
Authors: Peter A. Thomas, Christopher C. Lovell, and others including **Aswin P. Vijayan**
9. 2023 – **FLARES IX: The Physical Mechanisms Driving Compact Galaxy Formation and Evolution.** Submitted, MNRAS, [arXiv:2301.05228](#)  
Authors: William J. Roper, Christopher C. Lovell, **Aswin P. Vijayan**, and others
10. 2023: – **Massive galaxy formation caught in action at  $z \sim 5$  with *JWST*.** Published, A&A, [arxiv:2212.09372](#)  
Authors: Shuowen Jin, Nikolaj B. Sillassen, and others including **Aswin P. Vijayan**
11. 2022 – **Dilution of chemical enrichment in galaxies 600 Myr after the Big Bang.** Submitted, Nature, [arXiv:2212.02890](#)  
Authors: Kasper E. Heintz, Gabriel B. Brammer, and others including **Aswin P. Vijayan**
12. 2022 – **FLARES VIII. The Emergence of Passive Galaxies in the Early Universe ( $z > 5$ ).** Submitted, MNRAS, [arXiv:2211.07540](#)  
Authors: Christopher C. Lovell, Will Roper, **Aswin P. Vijayan**, and others
13. 2022 – **Unveiling the main sequence of galaxies at  $z \geq 5$  with the James Webb Space Telescope: predictions from simulations.** Published, MNRAS, [arXiv:2208.06180](#)  
Authors: Jordan C. J. D'Silva, Claudia D. P. Lagos, and others including **Aswin P. Vijayan**
14. 2022 – **Seeing sharper and deeper: *JWST*'s first glimpse of the photometric and spectroscopic properties of galaxies in the epoch of reionisation.** Submitted, MNRAS, [arXiv:2207.14265](#)  
Authors: James A. A. Trussler, Nathan J. Adams, and others including **Aswin P. Vijayan**

15. 2022 – **Discovery and properties of ultra-high redshift galaxies ( $9 < z < 12$ ) in the JWST ERO SMACS 0723 Field.** Published, MNRAS, [arXiv:2207.11217](#)  
Authors: N. J. Adams, C. J. Conselice, and others including **Aswin P. Vijayan**
16. 2022 – **The BLUETIDES mock image catalogue: Simulated observations of high-redshift galaxies and predictions for JWST imaging surveys.** Published, MNRAS, [arXiv:2206.08941](#)  
Authors: Madeline A. Marshall, Katelyn Watts, and others including **Aswin P. Vijayan**
17. 2022 – **First Light And Reionisation Epoch Simulations (FLARES) IV: The size evolution of galaxies at  $z \geq 5$ .** Published, MNRAS, [arXiv:2203.12627](#)  
Authors: William J. Roper, Christopher C. Lovell, **Aswin P. Vijayan**, and others
18. 2022 – **The Impact of Dust on the Sizes of Galaxies in the Epoch of Reionization.** Published, MNRAS, [arXiv:2110.12075](#)  
Authors: Madeline A. Marshall, Stephen Wilkins, and others including **Aswin P. Vijayan**
19. 2020 – **Nebular Line Emission During the Epoch of Reionization.** Published, MNRAS, [arXiv:1904.07504](#)  
Authors: Stephen M. Wilkins, Christopher C. Lovell, and others including **Aswin P. Vijayan**

Metrics can be found from the SAO/NASA Astrophysics Data System (ADS) webpage [here](#).

## TEACHING & OTHER EXPERIENCE

<b>Co-supervision of Andreas Kyster Rasmussen &amp; Maria Madsen, BSc students</b> An analysis of photometric redshifts in CEERS using eazy & bagpipes, co-supervision with Dr. Minju M. Lee, Dr. Steven Gillman & Prof. Thomas R. Greve	Cosmic Dawn Center, DTU September-November 2022
<b>Supervision of Rebeca G Reyes Carrion, Dawn-IRES student</b> Star formation efficiency in the First Light And Reionisation Epoch Simulations	Cosmic Dawn Center, DTU June-August 2022
<b>Co-supervision of Søren Staal, BSc student</b> Analysing the morphology of high- $z$ galaxies with FLARES and <i>JWST</i> , co-supervision with Dr. Steven Gillman	Cosmic Dawn Center, DTU Feb-June 2022
<b>2022 DAWN Fellowship Committee Member</b> Committee of peers to select from applicants for the 2022 Dawn Postdoctoral Fellowship	Jan-Feb 2022
<b>DISCnet Work Placement</b> , with Kenya Red Cross Society, Kenya (Online) Validation of inferences from satellite observations with ground survey data for drought impact studies	Mar-Nov 2020
<b>Co-supervision of Hamish Garnett, Mphys student</b> Mass and metallicity gradients in FLARES, main supervisor Prof. Peter A. Thomas Effect of random seeds and AGN on galaxy properties in the EoR using EAGLE simulation physics, main supervisor Prof. Peter A. Thomas	Astronomy Centre, University of Sussex Oct-Apr 2019/20 Oct-Apr 2020/21
<b>Associate Tutor</b> , School of Mathematical & Physical Sciences, University of Sussex Associate Tutor for the Foundation year physics course Properties of Matter ( <a href="#">F3216</a> ) Associate Tutor for the third year undergraduate physics course Extragalactic Astronomy ( <a href="#">F3209</a> )	2018-2020

## TALKS

<b>Shedding new light on the first billion years of the Universe</b> , Marseille, France Talk Title: <i>Reliability of Emission Line Ratios in EoR Galaxies: Impacts of Complex Star-Dust Geometry</i>	July 2023
<b>Dawn Summit 2023</b> , Cosmic Dawn Center, Denmark (Review Talk) Talk Title: <i>First Stars and Galaxies</i>	June 2023
<b>L-Galaxies Workshop</b> , University of Hertfordshire, UK (Invited Talk) Talk Title: <i>Dust modelling in L-Galaxies and some applications</i>	Nov 2022
<b>Dawn Summit 2022</b> , Copenhagen, Denmark Talk Title: <i>Consequences of star-dust distribution and geometry on EoR galaxies</i>	June 2022
<b>ADAM</b> (Annual Danish Astronomy Meeting), Fredericia, Denmark Talk Title: <i>FLARES: Unraveling the properties of massive galaxies at cosmic dawn</i>	May 2022

<b>NAM</b> (National Astronomy Meeting), Bath, UK (Online) Talk title: <i>FLARES: The photometric properties of galaxies at cosmic dawn</i>	July 2021
<b>EAS</b> (European Astronomical Society) Meeting (Online) Talk title: <i>Obscured star formation in the EoR with FLARES</i>	July 2021
<b>SAZERAC2</b> (Online) Talk title: <i>Properties of massive dusty-galaxies at cosmic dawn</i>	June 2021
<b>Virgo Consortium Meeting</b> (Online) Talk title: <i>Photometric properties of galaxies in the FLARE simulation</i>	Jan 2021
<b>SAZERAC</b> (Online) Talk Title: <i>Photometric properties of galaxies in the FLARE simulation</i>	July 2020
<b>EAS</b> (European Astronomical Society) Meeting, Leiden, The Netherlands (Online) Talk title: <i>FLARES: First Light And Reionisation Epoch Simulations</i>	Aug 2020
<b>Virgo Consortium Meeting</b> , Durham, UK Talk title: <i>FLARES: First Light And Reionisation Epoch Simulations</i>	Jan 2020
<b>Virgo Consortium Meeting</b> , Leiden, The Netherlands Talk title: <i>Detailed dust modelling in the L-GALAXIES' semi-analytic model of galaxy formation</i>	Dec 2018

## PROFESSIONAL ACTIVITIES AND ORGANISATION EXPERIENCE

<b>co-PI of the FLARES Project</b> , suite of re-simulations specially designed to study galaxies observable in the high-redshift Universe	Jan 2020-Present
<b>Virgo Consortium Meeting</b> , Organised discussion session on Mock observations of simulations The Virgo Consortium is an international grouping of scientists to carry out state-of-the-art cosmological simulations	July 2022
<b>DAWN Conference</b> , Co-chair of 'DAWN to Noon' discussion session	June 2022
<b>Astronomy on Tap</b> (AoT), Copenhagen, Organising committee member	June 2022 – Present
<b>Reviewer for Monthly Notices of the Royal Astronomical Society (MNRAS)</b>	Oct 2021 – Present
<b>Co-organiser of DAWN caketalks</b> , Weekly talks at the Cosmic Dawn Center on related topics	Oct 2021 – Present
<b>Scientific Organizing Committee (SOC) Member, Models and Simulations of High-Redshift Galaxies - Sazerac Sip</b> A short online conference to discuss current models and simulations of high-redshift galaxies	Oct 2021
<b>SOC Member, CIDER: The Cold ISM During the Epoch of Reionisation - Sazerac Sip</b> A short online conference to discuss current works on the cold ISM and dust in the EoR	Feb 2021
<b>Organizer</b> , Extragalactic Astronomy Journal Club, University of Sussex Organizing the extragalactic astronomy journal club, by delegating latest papers to discuss	2018-2019

## OUTREACH

<b>Astronomy on Tap</b> (AoT), Copenhagen, Denmark Talked about cosmological simulations of galaxy formation and evolution	Feb 2021
<b>BlueDot Festival</b> , Manchester, UK Volunteered at the Webb Telescope stand, talking to the public about the realm of astronomy it would be exploring	July 2018

## ACHIEVEMENTS

<b>DISCnet</b> scholarship to pursue PhD at University of Sussex, UK	30 Sept 2017 – 30 Sept 2021
Partial <b>Oort/NOVA</b> MSc scholarship from Leiden Observatory, The Netherlands	1 Sept 2015 – 31 July 2021
<b>GATE</b> (Graduate Aptitude Test) and <b>JEST</b> (Joint Entrance Screening Test) in Physics, All India Rank 88 and 71 (Some of the most competitive exams for graduate schools in India)	2015

## COMPUTING SKILLS

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<b>Languages</b>	C, Fortran (Basic), Julia (Basic), Python
<b>Astronomy Software</b>	casa, cloudy, gadget, SED fitting
<b>Others</b>	L <sup>A</sup> T <sub>E</sub> X, High Performance Computing, Machine Learning, Natural Language Processing

## ATTENDED CONFERENCES & WORKSHOPS

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<a href="#">SKIRT Days 2022</a> (Ghent University, Belgium), <a href="#">L-Galaxies Workshop</a> (University of Hertfordshire, UK), <a href="#">Virgo Consortium Meeting</a> (Max-Planck-Institut für Astrophysik, Garching, Germany), <a href="#">Dawn Conference</a> (Copenhagen, Denmark), <a href="#">Dawn Summit</a> (Copenhagen, Denmark), <a href="#">ADAM 2022</a> (Federecia, Denmark)	2022
<a href="#">EAS 2021</a> (Online), <a href="#">SAZERAC2</a> (Online), <a href="#">Virgo Consortium Meeting</a> (Online)	2021
<a href="#">The Rise of Metals and Dust in Galaxies through Cosmic Time</a> (Online), <a href="#">EAS 2020</a> (Online), <a href="#">SAZERAC</a> (Online), <a href="#">International Conference on Observing The First Billion Years of the Universe</a> <a href="#">Using Next Generation Telescopes</a> (Indore, India), <a href="#">Virgo Consortium Meeting</a> (ICC, Durham, UK)	2020
<a href="#">St Andrews Monte Carlo Radiation Hydrodynamics Summer School</a> (University of St Andrews, UK), <a href="#">STFC Data Intensive, Artificial Intelligence and Machine Learning Summer School 2019</a> (University of Sussex, UK)	2019
<a href="#">Parallel and GPU Programming in Python</a> (Surfsara, Amsterdam, The Netherlands), <a href="#">Virgo Consortium Meeting</a> (Lorentz Centre, Leiden, The Netherlands), <a href="#">STFC Summer School in Artificial Intelligence</a> <a href="#">and Machine Learning</a> (University College London, UK), <a href="#">DISCnet: High Performance Computing</a> (Old Thorns Manor, Liphook, UK), <a href="#">DISCnet: Machine Learning</a> (Old Thorns Manor, Liphook, UK), <a href="#">GRADnet: Observational Astrophysics</a> <a href="#">Workshop</a> (Old Thorns Manor, Liphook, UK), <a href="#">DISCnet: Statistics and Data Analysis</a> (Old Thorns Manor, Liphook, UK)	2018
<a href="#">Virgo Consortium Meeting</a> (Max-Planck-Institut für Astrophysik, Garching, Germany), <a href="#">DISCnet:</a> <a href="#">Introduction to Big Data</a> (Old Thorns Manor, Liphook, UK), <a href="#">DISCnet: Software Carpentry and Public Engagement with</a> <a href="#">Research Training</a> (Old Thorns Manor, Liphook, UK)	2017

## LANGUAGES

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Malayalam (Native), English (Fluent), Hindi (Intermediate), Sanskrit (Intermediate)

## REFERENCES

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- Dr. Stephen M. Wilkins, Astronomy Centre, University of Sussex, Brighton, UK  
**Email:** s.wilkins@sussex.ac.uk
  - Prof. Thomas R. Greve, Cosmic Dawn Center, DTU Space, DTU, Kongens Lyngby, Denmark  
**Email:** tgreve@space.dtu.dk
  - Prof. Peter A. Thomas, Astronomy Centre, University of Sussex, Brighton, UK  
**Email:** P.A.Thomas@sussex.ac.uk
  - Prof. Georgios E. Magdis, Cosmic Dawn Center, DTU Space, DTU, Kongens Lyngby, Denmark  
**Email:** geoma@space.dtu.dk