They grow up so fast: stellar accretion in a starburst cluster

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Publications

First author papers published in peer-reviewed journals

Externally irradiated young stars in NGC 3603. A JWST NIRSpec catalogue of pre-main-sequence stars in a massive star formation region
Ciarán Rogers, Guido De Marchi, and Bernhard Brandl
Published in Astronomy & Astrophysics
Volume 698, June 2025

Kinematic evidence of magnetospheric accretion for Herbig Ae stars with JWST NIRSpec
Ciarán Rogers, Bernhard Brandl, and Guido De Marchi
Published in Astronomy & Astrophysics
Volume 698, June 2025

Spectral characterisation of the extinction properties of NGC 3603 using JWST NIRSpec
Ciarán Rogers, Bernhard Brandl, and Guido De Marchi
Published in Astronomy & Astrophysics
Volume 688, August 2024

Determining stellar accretion rates from Pa_α and Br_β emission lines with JWST NIRSpec-Accretion of pre-main-sequence stars in NGC 3603
Ciarán Rogers, Guido De Marchi, and Bernhard Brandl
Published in Astronomy & Astrophysics
Volume 684, April 2024

First author papers published in non-peer-reviewed journals

Quantifying the contamination from nebular emission in NIRSpec spectra of massive star forming regions.
Ciarán Rogers, Guido De Marchi, Giovanna Giardino, Bernhard Brandl, Pierre Ferruit, and Bruno Rodriguez
Published in Space Telescopes and Instrumentation 2022: Optical, Infrared, and Millimeter Wave Volume 121803, August 2022

Co-author papers published in peer-reviewed journals

Protoplanetary Disks around Sun-like Stars Appear to Live Longer When the Metallicity is Low

Guido De Marchi, Giovanna Giardino, Katia Biazzo, Nino Panagia, Elena Sabbi, Tracy L. Beck, Massimo Robberto, Peter Zeidler, Olivia C. Jones, Margaret Meixner, Katja Fahrion, Nolan Habel, Conor Nally, Alec S. Hirschauer, David R. Soderblom, Omnarayani Nayak, Laura Lenkić, **Ciarán Rogers**, Bernhard Brandl, and Charles D. Keyes
Published in The Astrophysical Journal Volume 977, December 2024

Young Stellar Objects in NGC 346: A JWST NIRCam/MIRI Imaging Survey
Nolan Habel, Conor Nally, Laura Lenkić, Margaret Meixner, Guido De Marchi, Patrick J. Kavanagh, Katja Fahrion, Omnarayani Nayak, Alec S. Hirschauer, Olivia C. Jones, Katia Biazzo, Bernhard R. Brandl, J. Jaspers, Klaus M. Pontoppidan, Massimo Robberto, **Ciarán Rogers**, E. Sabbi, B. A. Sargent, David R. Soderblom, and Peter Zeidler
Published in The Astrophysical Journal Volume 971, August 2024

The early evolution of young massive clusters II. The kinematic history of NGC 6618/M 17
Mitchel Stoop, Annelotte Derkink, Lex Kaper, Alex de Koter, **Ciarán Rogers**, Maria Claudia Ramírez-Tannus, Difeng Guo and Naira Azatyan
Published in Astronomy & Astrophysics Volume 681, January 2024

JWST/NIRCam detections of dusty subsolar-mass young stellar objects in the Small Magellanic Cloud
Olivia C. Jones, Conor Nally, Nolan Habel, Laura Lenkić, Katja Fahrion, Alec S. Hirschauer, Laurie E. U. Chu, Margaret Meixner, Guido De Marchi, Omnarayani Nayak, Massimo Robberto, Elena Sabbi, Peter Zeidler, Catarina Alves de Oliveira, Tracy Beck, Katia Biazzo, Bernhard Brandl, Giovanna Giardino, Teresa Jerabkova, Charles Keyes, James Muzerolle, Nino Panagia, Klaus Pontoppidan, **Ciarán Rogers**, B. A. Sargent and David Soderblom
Published in Nature Astronomy Volume 7, April 2023

Curriculum Vitae

On the 25th of July 1995, I was born to two Irish parents, Ann and Rob, living in Manchester, England at the time. My sister Niamh, two years older than me, was naturally less than pleased with this development. At the turn of the millennium, my parents came to their senses and moved the family back to Dublin, Ireland, just in time for New Years Eve. I attended St. Fiachras primary school in Beaumont from 2000 to 2008. I had average maths skills and terrible handwriting, traits that I have carried with me to today.

Just after turning 13, I began secondary school at Ard Scoil Rís in Marino. I can recall in my second year, during science class, a student's book falling from their desk to the floor. As they began to pick up the book, my teacher, Mr O'Connor, stopped them. He explained that their book was trying to get to the centre of the earth, but the floor was stopping it. So long as the book lay where it was, it could not fall any more, so better to just leave it alone. I had never considered the force of gravity in quite those terms before. I believe that this was the moment that I became interested in physics. I graduated from Ard Scoil Rís in 2013 after completing my Leaving Certificate exams, obtaining 470 out of 625 possible points, enough to secure my place in the General Science degree at Dublin City University, more commonly referred to as DCU.

I was open to pursuing either physics or biology when I began my bachelor's degree. The practical lab sessions thoroughly convinced me that I was not cut out to deal with petri dishes, and I gladly opted to specialise in Physics and Astronomy for the remainder of my degree. I graduated in the Autumn of 2017 with first class honours.

I was not sure what I wanted to do, or be, following my bachelor's degree. I lived with two friends in Chicago in the summer of 2017, working in the old town as a waiter at the Italian restaurant Orso's. I spent the following year tutoring students in maths, physics and biology, and teaching science courses to young children on weekends at my former university, DCU.
My time was mostly occupied with playing Tony Hawks Underground on Playstation 2. Understandably, the novelty of having near infinite free time soon became a burden. More than anything, I wanted to move out and find my own place. I did what many twenty-somethings do when they are lacking direction, I started applying for Master's degrees. I thought I could kill two birds with one stone by applying outside of Ireland, where rent may be more affordable. Almost immediately I received an invitation from the University of Amsterdam to enrol in their Science for Energy and Sustainability Master's programme. I had felt a growing disconnect to astronomy in this time, and sought a more practical application of my skills. However, with virtually no savings and therefore no feasible way of affording a two year Master's in The Netherlands' most expensive city, I declined the invitation, determined to re-apply the following year with a healthier bank balance.

I gained employment working for Irish Water, the state water utility com-

pany. Hired initially as a graduate engineer, I quickly became useful as the only person in the office with any programming experience. I learned how to write in Visual Basic for Applications, or VBA, the language used to interact with Microsoft Office applications, like Excel. Informally, I became the office data engineer, automating and optimising the application process through which contractors apply for work through Irish Water. I can remember during lunch one afternoon, reading about the Event Horizon Telescope taking the first picture of a black hole. I realised that myself and astronomy hadn't actually broken up, I just needed some space. When applications for UvA opened again, I applied for the astronomy programme.

My partner Jessie and I moved from Dublin to Amsterdam in the late summer of 2019. We had managed to thread the needle, both enrolling in Master's programmes at UvA at the same time. We had found a beautiful apartment next to Vondel Park. We watched the first half of All the President's Men before falling asleep on our first night there. The first six months of living in Amsterdam were intense and exhilarating. Discovering Amsterdam, meeting new friends, doing my own laundry, it was an era of firsts. My degree was ultimately impacted by Covid 19, with the majority taking place strictly online. I finished my degree with the conclusion of my Master's research project, studying the variability of massive stars in M17, supervised by Dr. Annelotte Derkink and Prof. Lex Kaper. For the first time, I received a glimpse into what observational astronomy looked like. The reduction and analysis of those optical spectra from the William Herschel Telescope completely rewired my brain. I realised that I wasn't nearly ready to stop. Despite my continued protestations throughout my degree that I would not pursue a PhD, I found myself feverishly applying in the Autumn of 2020.

I was offered a position at Leiden University, working with Prof. Bernhard Brandl and Dr. Guido De Marchi. The research would consist of brand new JWST observations from NIRSpec and MIRI focusing on star formation in large clusters. This project was by far the one that I wanted most, and it goes without saying that I'm glad their first choice turned it down. I moved from Amsterdam to Leiden in Autumn of 2021. My time at Leiden has been blissful. I adore the city. I consider myself fortunate that my experience at the observatory has been overwhelmingly positive. The cohort of Master's students, PhD candidates and Post-docs makes it an extremely lively environment which I am going to dearly miss. My PhD research morphed and evolved organically over the four years, sliding from star formation, to protoplanetary disks and stellar accretion, to the impact of the external environment on star and planet formation. Bernhard and Guido were flexible and understanding with the direction my PhD took. They provided guidance when it was needed, while allowing me to make mistakes that would teach me important lessons. I was encouraged to submit a JWST Cycle 3 proposal following an exciting meeting with Dr. Olivier Berné at STScI in Baltimore. This program was accepted, and I view this as probably the most important milestone of my PhD.

It changed my perspective on what I was capable of achieving in astronomy, and provided me with enough confidence to apply for fellowships to pursue my own independent research following my PhD.

At the end of 2025 I will begin a position at STScI as an ESA research fellow. My Cycle 3 program will make up a large fraction of my research there. The inception of that program came about from a chance encounter at STScI two years earlier. This full circle moment brings me a lot of joy whenever I think about it.

Acknowledgements

I want to begin by thanking my two supervisors, Bernhard Brandl and Guido De Marchi, who I affectionately refer to as 'the supes' (though I don't think they are aware of this). You gave me the opportunity to work in Leiden on eye-watering observations, more beautiful and rich and inspiring than I deserved. Your faith, encouragement and guidance have propelled me through an intense period of growth and change, something I have in common with my favourite young stars. I feel comfortable calling myself an astronomer at the end of this process, and I have you both to thank for that. Thank you Bernhard. Thank you Guido.

The sterrewacht at Leiden is a vast and immersive community of researchers and students. I felt immediately invited and welcomed to join that community. Within a couple of days of arriving in Leiden, before my contract had even begun, I found myself at a summertime borrel outside of Huygens enjoying crisp Amstels and Leffes with Sill Verberne, Joshua Butterworth, Roi Kugel, Nicco Veronesi, Andrew Allan and Rob Kavanagh. The countless subsequent borrels, PhD defence parties, ski-trips, stupid food challenges, as well as all of the conferences that I had the privilege of attending with my new friends, these experiences have been the bedrock of my social life in Leiden.

My fellow JWST observers, Ivana van Leeuwen, Lucie Rowland, Amy Louca, Thomas Herard, Darío González Picos, Logan Francis and Lukasz Tychoniec, thank you for providing sympathetic ears when I would complain about this fabulous observatory. I need to specifically acknowledge my two NIRSpec MSA sisters, Chloe Cheng and Martje Slob. Wandering into your office to ponder the mysteries of the MSA was genuinely some of the most rewarding collaboration I experienced in Leiden.

Osmar and Kevin, my amigos. You guys throw the best parties. Here's to more living room karaoke.

My slightly more boyish doppelganger, Joey Braspenning. Bedankt voor jouw vriendschap. Ik kijk uit naar de volgende ski-trip, en natuurlijk ook de sauna. Tot ziens makker.

Probably the single most important influence in my life has been the work ethic of my parents, Ann and Rob. The only reason why any of this has happened is because you put me in the position for it to be possible. What feels like my natural tendency to push hard in my career, has been learned and assimilated from both of you. I really don't know people who have more endurance and committent than both of you, and these qualities are my greatest inheritance.

Finally, I need to address the single most important person during my time as a PhD student, as well as during all other times that I've known her, my partner, Jessica Whittle. We have gone through this entire Dutch odyssey together, completing our Master's degrees at UvA, going stir-crazy during Covid, and fantasizing about the modest luxuries that we would afford once we both had jobs. Free-way cola was just as good as the real thing if I was

drinking it with you.

We celebrated ten years together in Leiden, realising that we had now spent more time in the Netherlands than we had in Dublin. We've both come to understand the Netherlands in the same way, harshly criticising obnoxious Albert Heijn advertisements, while being unabashedly in love with this country, our home.

Although I was surrounded by fellow astronomers, you were the person who was most capable of understanding and empathizing with my experience. The low points would not have been bearable without you, and the high points are only meaningful because you're there. You are the most encouraging and supportive person that I know. You have bolstered me with a confidence and a belief that has fundamentally changed who I am, and the kind of person I want to be. You have gone through an incredible period of growth yourself. As proud as I am for what I have done with your support, I am even more proud of your own achievements. Multiple times, you made both personal and professional accomplishments that mere months before seemed like ludicrous pipe dreams. Your ambition to get what you want, in a foreign language in a foreign place, requires bravery and self belief that few people have.

None of the last six years would have happened without you. Thank you for dealing with me (especially during fellowship applications). This year has been the most challenging and overwhelming that we've experienced. Who'd have thought achieving your dreams could be so stressful? You have taught me that the most important thing to do during times like these is to be kind to each other. The storm eventually passes, and what's left is the love, the bond, the friendship of the two people who weathered it together. Thanks babe.