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Stellar radio beacons for Galactic astrometry

Quiroga Nunez, L.H.

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Author: Quiroga Nuñez, L.H.

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List of Publications

Refereed Publications

- **Quiroga-Nuñez L. H.**, van Langevelde H., Sjouwerman L., Pihlström Y., Brown A., Stroh M., Rich M. & Habing H., 2020, *Characterizing the BAaDE evolved stars in the Galactic foreground with Gaia*, in preparation
- **Quiroga-Nuñez L.H.**, Intema H., Callingham J., Villadsen J., et al., 2020, *Differences on radio emission from similar M dwarfs in the binary system Ross 867-8*, A&A 633, A130
- Immer K., Li J., **Quiroga-Nuñez L.H.**, Reid M., Wu Y. & Moscadelli L., 2019, *Trigonometric parallaxes in the far part of the Scutum arm*, A&A, 632, A123
- Reid M., Menten K., Brunthaler A., Zheng X., Dame T., Xu J., Li L., et al. (including **Quiroga-Nuñez L.H.**), 2019, *Trigonometric parallaxes of high-mass star forming regions: our view of the Milky Way*, ApJ, 885, 131
- **Quiroga-Nuñez L.H.**, Immer K., van Langevelde H., Reid M. & Burns, R., 2019, *Resolving the Distance Controversy for Sharpless 269*, A&A, 625, A70
- Pihlström Y., Sjouwerman L., Claussen M., Morris M., Rich M., van Langevelde H. & **Quiroga-Nuñez, L.H.**, 2018, *Positional Offsets Between SiO Masers in Evolved Stars and their cross-matched Infrared Counterparts*, ApJ, 868, 72
- **Quiroga-Nuñez L.H.**, van Langevelde H., Reid M. & Green J., 2017, *Galactic methanol maser distribution to constrain Milky Way parameters*, A&A, 604, A72
- Pinilla P., **Quiroga-Nuñez L.H.**, Benisty M., Natta A., Ricci L., Henning T., van der Plas G., et al., 2017, *Millimeter spectral indices and dust trapping by planets in brown dwarf disks*, ApJ, 846, 70
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- Surcis G., Vlemmings W., van Langevelde H., Hutawarakorn Kramer B. & **Quiroga-Nuñez L.H.**, 2013, *EVN observations of 6.7 GHz methanol maser polarization in massive star-forming regions II*, A&A 556, A73

Conference Proceedings

- van Langevelde H., **Quiroga-Nuñez L.H.**, Vlemmings W., Loinard L., Honma M., et al., 2019, *The Synergy between VLBI and Gaia astrometry*, PoS, EVN2018, V344, 43
- Immer K., Li J., **Quiroga-Nuñez L.H.**, Reid M., Zhang B. & Moscadelli L., 2019, *Where are you, Scutum? Tracking down a spiral arm with maser astrometry*, PoS, EVN2018, V344, 55
- Sjouwerman L., Pihlström Y., Trapp A., Stroh M., **Quiroga-Nuñez L.H.**, Lewis, M., et al., 2018, *A Masing BAaDE's Window*, IAU Proceedings 14 (S343), 334
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- Monnier J., Ireland M., Krauss S., et al., 2018, (including **Quiroga-Nuñez L.H.**) *Planet Formation Imager: Project Update* Proceedings SPIE 10701,1070118 (2018)
- **Quiroga-Nuñez L.H.**, van Langevelde H., Sjouwerman L., Pihlström Y., Reid, M., et al., 2018, *Maser, infrared and optical emission for late-type stars in the Galactic plane*, IAU Proceedings 13 (S336), 184
- **Quiroga-Nuñez L.H.**, van Langevelde H., Reid M., Sjouwerman L., Pihlström Y., et al., 2018, *Astrometric Galactic maser measurements cross-matched with Gaia*, IAU Proceedings 13 (S334), 351
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Curriculum Vitae

I was born on September 15th, 1989 in Bogotá, Colombia. My parents Hector Enrique Quiroga Cubillos and Flor Nancy Nuñez Torres, come from a small town called Paime (Cundinamarca). Both came to the capital city Bogotá, where later they became lawyers. I spent my childhood between Bogotá and La Vega, a town 80 km away from Bogotá where my grandmother was working as a high school teacher. I remember my grandmother as my first math mentor since we spent the two hours car journey from Bogotá to La Vega solving math riddles that she created to enhance my memory and math skills.

During my high school years, I joined the Colegio Mayor de Nuestra Señora del Rosario. A private catholic school founded by the King of Spain in 1653 with a long tradition and recognition, mainly for being considered as the “cradle of the Colombian Republic”, since several Colombian presidents, writers, scientists and artists attended this school. During this time, the school awarded me with the Jose Celestino Mutis prize, the highest honor that a student can receive. This award allowed me to waive all tuition fees at the school, but also gave me direct and waived access to the private university associated to the school, The University of Rosary. Unfortunately, this university was at that time mainly focused on health and political studies, while I prefer to find my scientific path in other university. At this time, my objective was already set to Astronomy.

In 2007, I enrolled in the Physics undergraduate program at the National University of Colombia, the biggest public university of the country, always keeping the hope to one day become an astronomer. During my bachelor, I have acquired the needed skills to develop scientific research at the highest standards. I do remember spending long and stressful nights with my classmates (who are also my best friends) studying for different exams in Electrodynamics, Quantum Mechanics and Experimental Physics. Moreover, I also had the opportunity to take several graduate courses in Astronomy and Education. In fact, I was sent by the University to the San Andres Island in the Caribbean to train math teachers in public high schools in how to engage young people to science.

During the last years of the undergraduate program, I had the opportunity to attend several national and international scientific events that allowed me to learn about astrophysics, build a scientific network and meet other cultures. In particular, I recognize two that became really important for my future prospectives. The first Colombia Congress of Astronomy and Astrophysics (COCOA) in 2012 held in Medellin, where I met several Colombian astronomers that later became my guide. And the European Research Interferometry School held in Rimini (Italy) in 2011, organized by RadioNet. This school was my first contact with radio astronomy.

After defending my bachelor thesis in gravitational waves, I did internships at two different astronomy related institutions. One at the ASTRON/JIVE summer program in 2012. This first was the time I visit the place that has become my second home in The Netherlands: Dwingeloo. In this internship, I started working with “masers”, and therefore, it set the basis for my long term career. My second intern position was held at the Space Telescope Science Institute at Johns Hopkins University in Baltimore (USA). This last position has been one of the most rewarding experiences as a young scientist that I have ever had by being the only Latinamerican in the Summer Astronomy Space Program 2013. In the time between these intern positions, I was contracted by the local government in the city of Bogotá to develop public policies in Astronomy for the Planetarium of Bogotá. These three labor experiences

have forged the basis of my career that was just starting. For fall 2013, I was planning to start a master program at McGill University with a scholarship from this Canadian university. However, Leiden University has made an offer that I hardly could not reject: The Oort Scholarship. This scholarship was given to the best non-Dutch student planning to follow a scientific career in astronomy. Coming back to my loved Holland made me really happy, and also because I brought with me my half soul, my best friend, my unconditional support: my wife. At the same time in Colombia, the Mazda foundation awarded me as one of the best prospective young physicists of the country for which I am deeply honored.

My time as a master student at Leiden was very challenging: living a married life, learning about a new culture, taking astronomy lessons in English for the first time, while I was meeting new people. I did the two research projects that each Leiden master student must develop in order to graduate. In my case, they were Galactic masers simulations, and work on pipelines to improve HST images of debris disks. These projects were hardly enough to set my expectations of how would be the life as a professional astronomer, for which I was determined to continue as a PhD researcher.

During 2015, at the same time that I was ending my master studies, I was searching for a PhD position. Although very good offers came from MPA, MPIfR, Manchester and Lund, two PhD offers were especially attractive: Leiden/JIVE and Cambridge. However, when I was deciding where to go, my wife got an art scholarship at Erasmus University in Rotterdam at around 40 km in the south of Leiden. By taking the joint position between Leiden and JIVE, I was not only very glad to stay in the Netherlands, but also we (together with my wife) found a temporary solution for our 2-body problem, where we both could do what we love (Science & Art).

For the whole PhD period (from Fall 2015 until now), I can only describe it as the most dynamic 4 years of my life. Living in Rotterdam, and commuting daily to Leiden and weekly to Dwingeloo to do research in Astronomy was my daily basis. However, I also learned other skills by becoming a Volleyball trainer for expats and the sacristan of the Catholic Church at Rotterdam. Important events also came such as the birth of my lovely daughter, the loss of my younger brother, a change of nationality, a meeting with Pope Francis and visiting more than 20 countries between business and holiday trips. Now by looking backward, I must say THANK YOU, particularly to God, my family and all the people that contributed with this crazy astronomical dream. Now, my next step continues in the United States of America, as a Jansky Fellow at National Radio Astronomy Observatory (Socorro) and the University of New Mexico (Albuquerque), where I am expecting to actively continue enjoying this life.

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