Pierrot Lamontagne

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Dr. Rafael Luque
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Dear Dr. Luque and the THIRSTEE Selection Committee,

I am thrilled to apply for the PhD position in exoplanet characterization within the ERC-funded *THIRSTEE* project at the Instituto de Astrofísica de Andalucía. With a robust background in radial velocity analysis and CMF studies, I am excited about the opportunity to contribute to your team and feel like I am worthy candidate for this position.

Currently, I am pursuing my Master degree in astrophysics under the supervision of Prof. David Lafrenière at the Université de Montréal. My research focuses on detecting and characterizing exoplanets around low-mass stars using high-precision radial velocity measurements from NIRPS and HARPS. As part of the NIRPS consortium, I specialize in estimating planetary masses and mitigating stellar activity signals using advanced Gaussian process models, including state-of-the-art multi-dimensional approaches. Additionally, I have worked extensively with the Line-by-Line method, a cutting-edge data reduction technique that significantly improves radial velocity measurements. These approaches are directly relevant to *THIRSTEE*'s aim of precise bulk density measurements for small planets which depends on high quality RV reduction and analysis.

My work has been enriched by collaborations with prominent scientists in the radial velocity field, including Dr. Étienne Artigau and Dr. François Bouchy. The collaborative and international nature of *THIRSTEE* resonates deeply with my experiences in team-oriented projects like NIRPS, where I worked alongside researchers across institutions to tackle complex datasets from systems of various types (young stars, slow rotators, multi-planetary systems, etc.). Through the NIRPS consortium and ESO, I had the incredible opportunity to participate in an observing run at the La Silla Observatory. This experience required me to meticulously plan night observations and conduct them over several nights, using the telescope to collect high-quality data. The hands-on experience of working at La Silla aligns closely with the opportunities available at IAA-CSIC's facilities, such as CAHA and OSN observatories, which emphasize the importance of direct engagement with cutting-edge instrumentation.

Additionally, during my master's, I wrote a JWST proposal focused on the atmospheric study of a brown dwarf, LHS 6343C, exploring its temperature, luminosity, and atmospheric mapping. Writing this proposal honed my skills in crafting competitive and scientifically compelling observing programs, a critical competency for utilizing the state-of-the-art facilities at IAA-CSIC and collaborating on large-scale international projects like SKA, EST, and ELT. These experiences have provided me with a solid foundation in both observational planning and proposal writing, which I am eager to bring to the research environment at IAA-CSIC.

At the Trottier Institute for Research on Exoplanets, I have participated in large-scale projects and outreach initiatives, fostering a collaborative spirit akin to the international scope of THIRSTEE. From working on NIRISS algorithms for JWST in large teams to host-

ing stargazing workshops with the astronomers of my institute, I thrive in dynamic research environments like IAA-CSIC.

Moreover, I am eager to engage in outreach and science communication initiatives, building on the strong foundation of experience. From my time as a science communicator in an astronomy museum to mentoring young college students in my master's project or teaching a physics class at college Montmorency as a professor, sharing my passion for astrophysics has always been a priority. I hope to be able to continue to inspire wonder through science communication during my time at IAA-CSIC.

Joining the dynamic environment at IAA-CSIC presents an unparalleled opportunity to further my academic journey while contributing to groundbreaking discoveries about planetary origins and compositions. Moving to Europe—and particularly to Spain—represents not only the fulfillment of a lifelong aspiration but also an exciting chance to immerse myself in a rich cultural and scientific landscape. Spain's renowned tradition in astrophysics, coupled with the warm and dynamic atmosphere of its research community, provides an ideal setting for personal and professional growth. I look forward to meeting new people and great scientists with various experiences and background with which I can engage in meaningful interactions. Additionally, the opportunity to experience Spanish culture, language, and way of life would greatly enrich my journey, blending academic rigor with cultural exploration in a way that I believe would be truly transformative.

Thank you for considering my application. I hope to have the opportunity to discuss how my skills and experiences align with the goals of *THIRSTEE*.

Sincerely,

Pierrot Lamontagne

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M.Sc. Candidate in Astrophysics, Université de Montréal