

The missing link: Investigating Sz91

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1 About the principle investigator

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Biography: After living abroad my entire life, I decided to come to the country from which my parents originate in order to study Astronomy. This led to me starting my Astronomy Bachelors in the summer of 2014. For my final research project I did an exploratory analysis of Sz91 together with my research partner, bringing the interesting aspects of the system to light for the first time. After attaining my Bachelors degree in 2017, I was given the opportunity to lead my student society for a year a head of the board. This gave me very valuable experience in undertaking projects, leading a team and helped my develop my interpersonal skills. After this year, I started my Masters in Astronomy and Data Science and did research on training a Convolutional Neural Network to classify radio galaxies in LOFAR data. With the experience gained in the last two years, I would once more like to turn my eyes to Sz91.

2 Summary

Make a high resolution of the proto-planetary disk named Sz91 using ALMA in order to investigate the evolution of proto-planetary disks.

3 Project description

Thanks to the successful development of the Atacama Large Millimeter Array (ALMA), we are now able to make high resolution images of protoplanetary systems in neighbouring gas clouds. This has led to the first direct evidence of protoplanets in the accretion desk of a young star, allowing us to directly study the properties of such young systems. The unique features of Sz91 make producing a high resolution image of this system the next step in furthering our understanding of the evolution of protoplanetary disks and, in extension thereof, the history of our solar system.

Innovative Research Aspects: What makes this research innovative is the fact that it employs recently developed technology in order to observe an object with properties which have been proven to be unique. High quality observations of this object will give new critical insights in the evolution of solar systems.

4 Plan and Budget

Proper funding a PhD student for 2 years in the Netherlands costs € 78,000.-. We believe that it would take full-time researcher this time in order to carry out the following tasks:

- Write an observing proposal for ALMA.
- Perform the necessary pre-processing of the data.
- Carry out the full scientific analysis of Sz91.
- Publish the results.