

A Giant Telescope in Italy Joins the Search for Intelligent Life in our Galaxy

The Sardinia Radio Telescope partners with *Breakthrough Listen* in a program to probe new frequencies for alien signals

Milan, Italy – October 15, 2024 – Today, at the International Astronautical Congress in Milan, Italy, scientists searching for signs of intelligent life beyond Earth will present the first results from a new partnership between the Breakthrough Listen initiative and the Italian national institute for astrophysics (INAF).

Using cutting-edge computing hardware installed at INAF’s Sardinia Radio Telescope (SRT), the researchers surveyed the dynamic central region of our Milky Way Galaxy, in addition to 72 stars designated as “targets of interest” by NASA’s Transiting Exoplanet Survey Satellite. With a dish measuring 64 meters across, the SRT is one of the ten largest radio telescopes on Earth.

The new study, led by four students who worked at the SRT during Summer 2022¹, uses two instruments on the telescope that are sensitive to different ranges of radio frequencies.

“Breakthrough Listen has previously published results from observations of TESS targets and the Galactic Center using other telescopes,” says Listen’s Project Scientist for International Collaborations, Dr. Vishal Gajjar, who is a co-author on the new study. “The new SRT observations are complementary, covering some of the same frequencies previously scanned, but also extending to new parts of the radio spectrum, at frequencies around 18 GHz.”

“There are good reasons to think that an extraterrestrial engineer would know about radio technology, but we can’t make assumptions about the frequencies at which it might operate,” explains Lorenzo Manunza, the lead author of the new paper. “That’s why it’s crucial that we cover as many radio channels as possible using a variety of observing facilities.”

“It’s exciting to see technosignature searches expanding to new facilities, and it’s great that early career researchers have the opportunity to work on the significant science and engineering challenges to make these searches a reality” remarks Karen Perez, a graduate student researcher working with Breakthrough Listen based at Columbia University. Perez, also a co-author on the paper, led the analysis of the Galactic Center data from SRT, and mentored and trained the Italian students, drawing from her own experience as a former summer intern with Listen.

“The search for extraterrestrial intelligence, or SETI, provides remarkable scientific returns,” adds Dr. Maura Pilia, another co-author, who also directs the internship programs at SRT. “But in addition to helping us to answer the profound question, ‘Are we alone?’, we can use the same datasets to do ancillary science almost for free. This could include searches for transient radio sources such as fast radio bursts, as well as studies of exoplanets, which have not been sufficiently explored at these high radio frequencies to date.”

¹ Luca Pizzuto, currently a research scientist with the German Aerospace Center (DLR) in Munich; Alice Vendrame, currently enrolled in a PhD program at Penn State University; Monica Mulas, studying at the University of Cagliari; and Lorenzo Manunza, now a contractor for the European Space Agency in Rome.

“No confirmed extraterrestrial signals were detected in the new observations,” says SRT SETI coordinator and study co-author Dr. Andrea Melis, “but the SRT is helping to place new constraints on the prevalence of technology across our Galaxy. The results have been submitted for publication in the peer-reviewed journal *Acta Astronautica* and will be a valuable contribution to the scientific literature.”

International interest in SETI is growing. As well as a full day of talks at the International Astronautical Congress in Milan, including presentations by Gajjar, Manunza, Pilia, and Perez, a conference of SETI researchers held in Sardinia on October 10 and 11 attracted around 100 researchers, including many from INAF as well as collaborators from around the globe.

Breakthrough Listen, headquartered at the University of Oxford, is the world’s most comprehensive search for “technosignatures”, or signs of intelligent life in the Universe. Listen collaborates with facilities around the globe, including many of the most powerful radio telescopes, as well as cutting-edge observatories operating in other regions of the electromagnetic spectrum. It aims to survey one million nearby stars, the entire galactic plane and 100 nearby galaxies. Additional information: breakthroughinitiatives.org.

The National Institute for Astrophysics (INAF) is the leading Italian research organisation dedicated to the study of the Universe. It promotes, conducts, and coordinates research activities in astronomy and astrophysics nationally and internationally. INAF designs and develops innovative technologies and cutting-edge instruments to study and explore the cosmos. It also plays a crucial role in spreading scientific knowledge through educational and outreach projects in astronomy aimed at schools and the wider public.

Further information: <http://www.inaf.it>

The Breakthrough Initiatives are a suite of scientific and technological programs investigating the fundamental questions of life in the Universe. The Breakthrough Initiatives are funded by the Breakthrough Foundation established by Yuri and Julia Milner. Additional information about Yuri: yurimilner.com.

A preprint of the paper, links to the data used, and the accompanying art, can be found at <https://breakthroughlisten.web.ox.ac.uk/bl-srt-partnership>