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Memorie della

SETI days in Milan

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Abstract. In 2016 and 2017, the INAF Institute of Space Astrophysics and Cosmic Physics (Istituto di Astrofisica Spaziale e Fisica Cosmica, IASF) in Milan organized two one-day meetings aimed at exploring the interest of the Italian professional and amateur community towards the SETI issue and towards research in that area through different approaches: methodological, observational and managerial.

1. Introduction

The discovery of thousands of exoplanets, some of which with a mass similar to Earth and orbital parameters indicating that they are in the inhabitable zone around their star, has renewed the interest in the search for other life forms in the Universe. A recent social psychology study has tried to assess humans' reactions to the hypothetical announcement of the discovery of extraterrestrial life[1]. The study examines several cases in recent years and employs a software for textual analysis in order to assess the degree of positivity (or negativity) in the words used to describe the scientific discovery and the perception of the potential risk connected to a given news. It begins with the analysis of newspaper articles published over 50 years and announcing discoveries of various kinds, from the discovery of technologically advanced civilizations to that of the Martian bacteria. The aim of the research is not to consider the truthfulness of each piece of news, but to assess how they are written by examining the message using the LIWC software (Linguistic Inquiry and Word Count). The result is quite clear: the message conveyed by the articles is positive. The authors were more fascinated by the idea that some evidence of the existence of alien life forms had or might have been found, rather than worried about the possible consequences.

[1] `https://www.frontiersin.org/articles/10.3389/fpsyg.2017.02308/full`

2. The SETI days in Milan

In 2016 and 2017 the INAF Institute of Space Astrophysics and Cosmic Physics organized two one-day meetings dedicated to the SETI research at the National Research Council in Milan. The purpose of the meetings was to review the activities of both the community of professional astronomers and of the amateur world - amateur astronomers and radio amateurs - in Italy. These meetings were part of the general cultural activities of the Institute, whose areas of research (and of funding) do not include any research connected to SETI. This fascinating subject is being promoted by Claudio Maccone, INAF associate and Chair of the SETI Committee, who organized the meetings. We experienced an interesting mix of expertise and competences. A pleasant surprise was the presence of a group of high school students who, thanks to their teacher's passion, built a small radio-telescope which they used to explore the planetary systems discovered by the Kepler mission. Both in 2016 and in 2017 we were delighted to have with us Andrew Siemion representing the Breakthrough Initiatives[2], a project financed by Yuri Milner, with a total amount of 100 million dollars over 10 years, to strengthen the SETI research both from the technological and observational point of view. Siemion is responsible for the Breakthrough Listen initiative, whose purpose is to reach a one-day listening capability superior to that of one whole year of the previous SETI.

2.1. SETI Italia 2016

SETI Italia 2016 was held on 11th May 2016. The program[3] is available on, and includes presentations, which can be downloaded. The original program was structured in four parts: Italian Radio SETI, Italian Optical SETI, Neutrino SETI and Astrobiology and SETI. However, the part concerning neutrinos was canceled shortly before the event because the speaker was not able to attend.

The meeting was introduced by two speeches. In the first, Giovanni Bignami described the potential of the project Square Kilometer Array (SKA) to contribute to the search of signals from extraterrestrial civilizations on planets orbiting around nearby stars; in the second, Andrew Siemion spoke about the Breakthrough Listen Program.

In the part devoted to Italian Radio SETI the topic of discussion was the KLT (Karhunen-Love Transform) and its application to SETI research, both in Medicina and at the Sardinia Radio Telescope (SRT). The topic was introduced by Claudio Maccone. The implementation in Bologna was described by Pierpaolo Pari and that at the SRT by Andrea Melis and Raimondo Concu. Stelio Montebugnoli's presentation concerned the possibility of a new antenna for SETI observations at 1420 MHs and Germano Bianchi described the use of the BEST-4 array as a SETI instrument. Stefano Bologna (from the Val Pellice Amateur Observatory) described the project carried out by high school students to observe the planets discovered by Kepler with a do-it-yourself 8 m antenna. Giovanni Vladilo discussed the choice of the most interesting planets on the basis of habitability models.

The second part of the meeting concerned the issue of SETI research at optical wavelengths (OSETI). Giuseppe Savio and Alberto Villa (from ADAA, Associazione Divulgazione Astronomia e Astronautica, Association for Astronomy and Astronautics Popularization) described the instruments developed for amateur observatories in Lombardy. I spoke on behalf of the ASTRI project describing the potential of the prototype of the Cherenkov dual-mirror small telescope, built by INAF within the Cherenkov Telescope Array project (CTA). ASTRI is currently being tested at the Catania Observatory at Serra la Nave primary tessellated mirror 4-metre in diameter. Once the series of tests is completed, the telescope might be adapted to optical SETI, because it appears to be fit for searching for very brief flashes of lights coming from hypothetical extraterrestrial civilizations.

The last presentation of the meeting was that of Giuseppe Galletta, from the University of Padova, about astrobiology, an interdisciplinary issue which connects astrophysics, biology, chemistry and even sociology.

2.2. SETI Italia 2017

SETI Italia 2017, held on 5th June 2017, was more international in its scope, with French and Dutch guests, together with our friend Andrew Siemion. In the introduction, after an update on the Breakthrough Listen project by Andrew Siemion, Osvaldo Catalano spoke about the potential use of ASTRI's ultra-fast camera in the field of optical SETI. It is worth remembering that researchers belonging to the American SETI world asked the CTA Consortium to explore the possibility of searching for optical signals in the wide por-

[2] `https://breakthroughinitiatives.org`

[3] `http://sim.oa-cagliari.inaf.it/wordpress/program/`

tion of the sky which will be probed by the several dozens of Cherenkov telescopes which will be part of the Array.

The program[4] of SETI Italia 2017, available on together with the presentations, was divided into six brief parts focused both on issues already discussed in 2016, with presentations aimed at providing updates, and on new topics.

The first part was dedicated to the Italian Radio SETI, with a summary of KLT by Claudio Maccone and Nicolo' Antonietti and a report on the state of the SETI research at the Sardinia Radio Telescope by Andrea Melis and Delphine Perrodin.

The second part was focused on European research, with a Dutch contribution by Marc Wolf, who spoke about the SETI@CAMRAS project, and a French one by Elisabeth Piolelat, who spoke about SETI@home and the contribution of citizen scientists to a series of projects linked to the search for extraterrestrial life. SETI was shown to be a powerful way to bring the general public closer to science.

In the third part, which concerned optical SETI, Alberto Villa described a project for a new instrument.

In the fourth part Daniela De Paulis, Stephen Whitmarsh and Guillaume Dumas introduced a new topic: exo-neurobiology, whose aim is to use brain impulses as a code for transmitting and decoding signals to and from alien worlds.

In the fifth section Amedeo Balbi discussed the interaction between SETI and media in case of a suspected or verified contact with the aliens. The scenarios imagined in the '90s have clearly been rendered outdated by the new means of communication of our interconnected world. Taking as an example what happened in the case of the discovery of gravitational waves, Balbi demonstrated that it would be impossible to keep the news confidential and invoked the need for a shared management of information.

The last part focused on SETI's future developments, with the presentation of new and ambitious missions.

Unfortunately, in 2017 no students were present; however, the SETI meeting led to the proposal to start a school-work program (alternanza scuola-lavoro) dedicated to exoplanets search and exobiology.

3. Conclusions

The SETI meetings in Milan involved many researchers and allowed us to build an excellent relationship with Andrew Siemion, who confirmed his interest and the interest of Breakthrough Initiatives in starting a collaboration with INAF. The possibility of using Italian radio-telescopes, which could be equipped with innovative instruments designed and built in Berkeley, is of great interest to Breakthrough Listen and will certainly be explored in the future.

[4] http://sim.oa-cagliari.inaf.it/seti2017/program/