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Call for proposals

Deadline Sep 26, 2024, UT 15.00

Observing proposals are invited for the Effelsberg 100-meter Radio Telescope of the Max Planck Institute for Radio Astronomy (MPIfR).

The Effelsberg telescope is one of the World's largest fully steerable instruments. This extreme-precision antenna is used exclusively for research in radio astronomy, both as a stand-alone instrument as well as for Very Long Baseline Interferometry (VLBI) experiments.

Access to the telescope is open to all qualified astronomers. Use of the instrument by scientists from outside the MPIfR is strongly encouraged. The institute can provide support and advice on project preparation, observation, and data analysis.
The directors of the institute make observing time available to applicants based on the recommendations of the Program Committee for Effelsberg (PKE), which judges the scientific merit (and technical feasibility) of the observing requests.

Information about the telescope, its receivers and backends and the Program Committee can be found at
http://www.mpifr-bonn.mpg.de/effelsberg/astronomers
(potential observers are especially encouraged to visit the wiki pages!).

New broad-band receiver

The new "Ultra-Broad-Band"-Receiver (UBB) is a prime focus system covering the frequency range of 1.3-6 GHz. The system is now ready for regular observations. For more information, see the description of the system in the issue 01/24 of this newsletter.

Observing modes

Possible observing modes include spectral line, continuum, and pulsar observations as well as VLBI. Available backends are several FFT spectrometers (with up to 65536 channels per subband/polarization), a digital continuum backend, a number of polarimeters, several pulsar systems (coherent and incoherent dedispersion), and two VLBI terminals (dBBC and RDBE type with MK6 recorders). Furthermore, the new flexible, fully-digital

backend system EDD ("Effelsberg Direct Digitization") is currently being implemented and will be available for an increasing number of observations in the near future.

Receiving systems cover the frequency range from 0.3 to 96 GHz. The actual availability of the receivers depends on technical circumstances and proposal pressure. For a description of the receivers see the wiki pages.

How to submit

Applicants should use the NorthStar proposal tool for preparation and submission of their observing requests. North Star is reachable at https://northstar.mpifr-bonn.mpg.de .

For VLBI proposals special rules apply. For proposals which request Effelsberg as part of the European VLBI Network (EVN) see:
http://www.evlbi.org/using-evn.

Information on proposals for the Global mm-VLBI network can be found at http://www3.mpifr-bonn.mpg.de/div/vlbi/globalmm/index.html .

Other proposals which ask for Effelsberg plus (an)other antenna(s) should be submitted twice, one to the MPIfR and a second to the institute(s) operating the other telescope(s) (eg. to NRAO for the VLBA).

Important Remarks

Please note, that the Effelsberg Programme Committee (PKE) is composed of several scientist with different backgrounds. It is hence advisable to write the proposals in a way that they could be understood by readers who are not working in the particular field.
Furthermore, it should be noted that all proposals are treated confidentially. Therefore, it is not necessary to withhold or obscure information, which on the contrary might lead to a downgrading of the proposal.

The following deadlines will be on on Feb 4th, 2025, and on May 28th, 2025.

Opticon-RadioNet-Pilot Transnational Access Programme

The Opticon-RadioNet-Pilot (ORP) project
(see http://www.orp-h2020.eu)
includes a coherent set of Transnational Access (TA) programs aimed at significantly improving the access of European astronomers to the major astronomical infrastructures that exist in, or are owned and run by, European organizations.

Astronomers who are based in the EU and the Associated States but are not affiliated to a German astronomical institute, may also receive personal aid from the Transnational Access (TA) Program of the ORP. This will entail free access to the telescope, as well as financial support of travel and accommodation expenses for one of the proposal team members to visit the Effelsberg telescope for observations.

One – in exceptional cases more – scientists who are going to Effelsberg for observations can be supported, if the User Group Leader (i.e., the PI – a User Group is a team of one or more researchers) and the majority of the users work in (a) country(ies) other than the country where the installation is located. Only user groups that are allowed to disseminate the results they have generated under this program may benefit from the access.

For more details see http://www.orp-h2020.eu/TA-VA .

After completion of their observations, TA supported scientists are required to submit their feedback to the ORP project management and the EU. Publications based on these observations should be acknowledged accordingly:

The research leading to these results has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004719 [ORP].

by Alex Kraus

News from the observatory

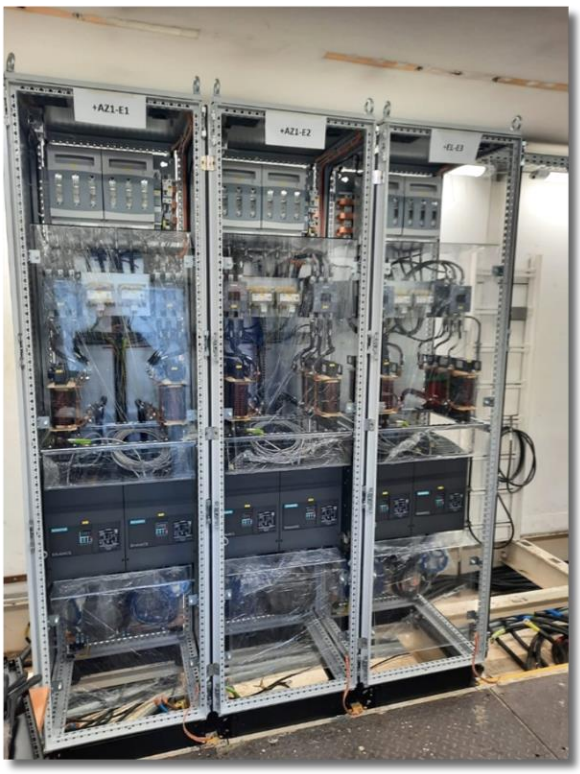
Project to renew the main axes drive control is going to finish soon

As reported earlier (issues 1/2023 and 2/2024 of this newsletter), we started a project to renovate the main axes drives of the 100-m telescope, including the power units and the corresponding control systems.

In this summer, the final act of the project started. Observations at the 100m-telescope ceased on June 24, and immediately afterwards, the exchange of the hardware started. Though a bit delayed, the project is now close to the completion. On September 4th the telescope has been moved again for the first time in manual mode and at the time of this writing further tests under computer control are imminent.

We expect the telescope to be available for regular observations again at the end of September.

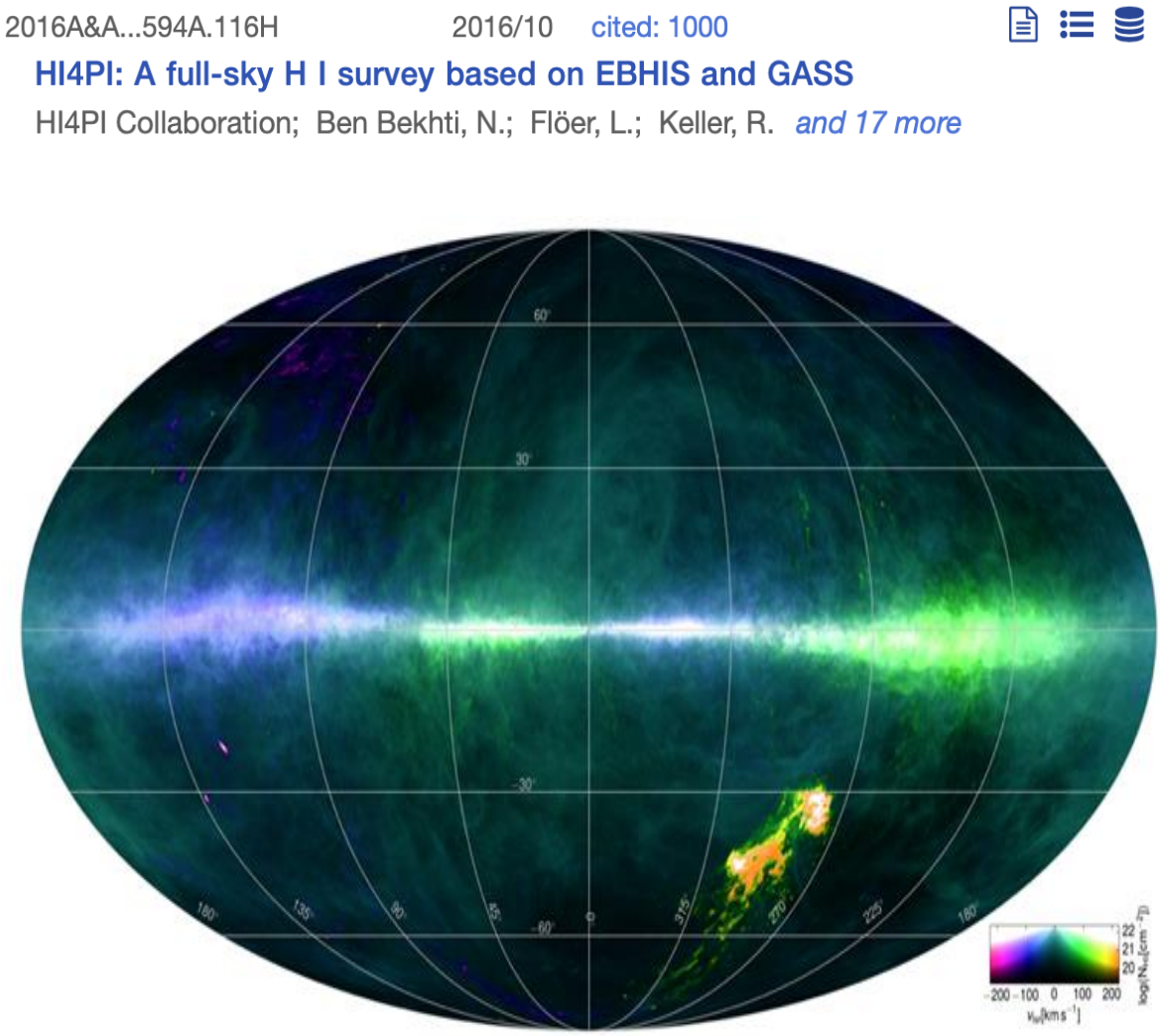
A more detailed description about the changes made during the project will be given in the next issue of this newsletter.



Installing new racks for the drive control in the telescope (Andre Bauerfeind, MPIfR)

The HI4PI publication hits 1000 citations

The data release paper of the all-sky HI survey reached the number of 1000 citations recently! The paper which is based on the GASS ("Galactic All Sky Survey") survey with the Parkes telescope and the Effelsberg-Bonn HI survey ("EBHIS") was published in 2016 by the HI4PI collaboration. This survey has been the most sensitive all-sky HI survey so far, and as indicated by the huge number of citations, the data is of enormous legacy value and an important base for all kind of astrophysical research.



All-sky column density-velocity map in Galactic coordinates (B. Winkel and the HI4PI collaboration).

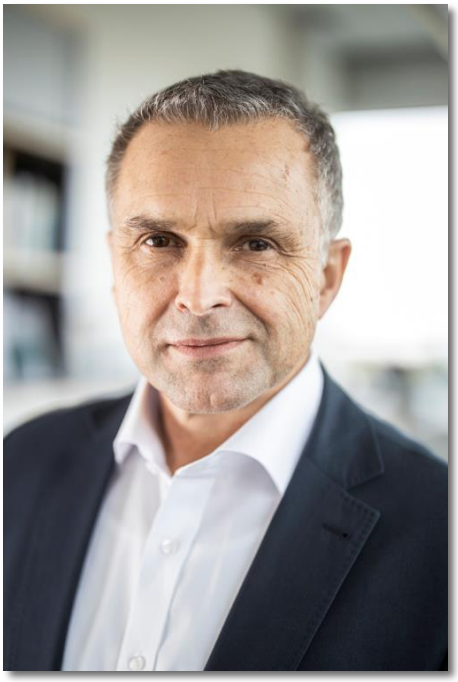
Karl Schwarzschild Medal 2024 for Anton Zensus

MPIfR Director receives highest award of the Astronomical Society

The Astronomische Gesellschaft awards the Karl Schwarzschild Medal to Prof. Dr. Anton Zensus, Director at the Max Planck Institute for Radio Astronomy in Bonn. This highest award for astronomers in Germany recognizes his leading role in the development of radio astronomical observation methods with very high angular resolution and sensitivity.

Very Long Baseline Interferometry (VLBI) has developed into a key observation method, particularly due to the influence of Anton Zensus and his research group. In addition to astrophysics, it is also widely used in the fields of astrometry and geodesy. Thanks to these advances and international cooperation, groundbreaking astronomical observations are possible now. The unique images from the Event Horizon Telescope project, which show the supermassive black holes in the elliptical galaxy M87 and in the center of our Milky Way, have caused a worldwide sensation and opened up new avenues for research into active galactic nuclei.

The medal was awarded on Tuesday, September 10, at the annual meeting of the Astronomische Gesellschaft in Cologne, Germany.



Prof. J. Anton Zensus, Director at the Max Planck Institute for Radio Astronomy (MPIfR) in Bonn, Germany, Head of the research department „Radio Astronomy / VLBI“ at the MPIfR.

Anton Zensus, Director at the Max Planck Institute for Radio Astronomy (MPIfR) and head of the research department "Radio Astronomy / VLBI" at the MPIfR, has been a leading figure in the development of radio astronomy with extreme angular resolution and sensitivity for decades. Already in the early 1980s, he made significant contributions to the technique of "Very Long Baseline Interferometry" (VLBI) which makes it possible to image the structure of the central regions of active galactic nuclei. At that time, VLBI was optimized for radio waves in the centimetre range and could produce images on the scale of light years. This was sufficient to study details in the jets, but not to fully resolve the central source of the galaxies and identify their driving mechanisms.

To confirm the prediction that the central driving mechanisms consist of supermassive black holes, a much higher resolution was required. This meant extending the VLBI technique to shorter wavelengths in the millimeter range and even including radio telescopes orbiting the Earth.

Anton Zensus and his team at the MPIfR rose to this challenge. They integrated the IRAM telescopes on Pico-Veleta in Spain and on the Plateau de Bure in France into VLBI observations at 1.3 mm wavelength. Subsequently, the VLBI network was extended to transatlantic scales and established in collaboration with international partners as the "Global Millimeter VLBI Array" (GMVA), which provided reliable research data at 3 mm wavelength. The next step was to select telescopes capable of observing at 1.3 mm and even at 0.87 mm wavelength (230 and 345 GHz respectively), including the two IRAM telescopes, APEX and ALMA, and to equip the telescopes with the necessary hardware and software.

Since the late 1970s, it had been known from calculations that the event horizon of a supermassive black hole appears as a dark "shadow" whose size in the sky depends directly on the distance and mass of the object against the distorted background of gas emissions from its surroundings. The small size of the expected shadow, even for the best candidates, the central sources of the galaxy M87 and our Milky Way, made it clear that significant improvements in observational technology and global collaboration were needed to image these objects directly. This gave rise to the "Event Horizon Telescope" (EHT) project, which uses VLBI observations at short wavelengths (1.3 mm). This is done with a large number of telescopes distributed across Europe, North and South America, Oceania and Antarctica to achieve an angular resolution of 20 microarcseconds.

The EHT measurements not only confirmed the masses previously determined by other methods, but also made it possible for the first time to image the shadow of a black hole compared to the relativistic matter orbiting it in close proximity - just a few Schwarzschild radii from the center.

The Schwarzschild radius corresponds to the radius defining the event horizon of a black hole in the Schwarzschild solution of Einstein’s field equations. It is named in honor of the German astronomer Karl Schwarzschild after whom the Karl Schwarzschild medal is named.

This is much closer to the central source than with other methods, and into the region where the effects of general relativity are most clearly visible. Anton Zensus played an important and fundamental role from the very beginning, especially as the founding chairman of the EHT board. He succeeded in promoting and stabilizing the necessary but complex synergies between various initially competing groups in Europe, the USA and Asia, which ultimately made the success of the EHT possible.

"The Karl Schwarzschild Medal of the Astronomical Society is a great honor. It recognizes our achievements in getting closer and closer to the innermost regions and the central driving sources of active galactic nuclei. With the contributions of our global team and the research possibilities of the Max Planck Society, we have succeeded in making black holes directly visible for the first time, namely as a silhouette against the background of the luminous gas surrounding them," Anton Zensus is pleased to say.

The award is in line with a number of earlier Schwarzschild Prize winners investigating the central sources of active galaxies, starting with the discovery of quasars (Maarten Schmidt, KSM 1968), accretion disks around black holes (Bohdan Paczinsky, KSM 1981), the question of whether there are black holes in every galaxy (Martin Rees, KSM 1989) and most recently the investigation of supermassive black holes, in particular Sgr A*, in the centers of galaxies (Reinhard Genzel, KSM 2011).

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