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Greetings from the Director

Happy New Year, 2018!

It is my pleasure to wish everyone a very happy and healthy new year 2018! The beginning of the year is always a good moment to reflect on the achievements of the past year and to look ahead into the future. As mentioned previously in this Newsletter, that is exactly what we intend to do for Effelsberg. On February 20th and 21st, we are looking forward to welcoming many of you to our

Effelsberg workshop *"The Big Impact of a Big Dish: Science with the Effelsberg 100-m telescope"*. Initially planned for Spring 2017, for organizational reasons we had to move it twice, most lately due to the overbooking of accommodation in Bonn during the recent UN Climate Summit. Despite this inconvenience, we are very pleased by the excellent response from so many people, and we regret that we had to close the registration as we had reached our capacity quickly. But it was important that we have sufficient time to listen to you as the users, that have the chance to present to you new technological developments, and that we receive input on instrumentation that may interest you. We will report on the outcome of the workshop in this Newsletter later this year. For now, I wish to thank the LOC and SOC already for the preparation, and I look forward to see many of you at the workshop.

Best wishes,
Michael Kramer



Call for proposals – Deadline Feb 5, 2018, UT 15:00

by Alex Kraus



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!).

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 MK5 recorders).

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 web pages.

Please note, that observing proposals for the new Phased-Array-Feed cannot yet be accepted – the system is still being commissioned.

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/proposals/>.

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).

After February, the next deadline will be on Jun 5, 2018, 15:00 UT.

RadioNet Transnational Access Programme

by Alex Kraus

RadioNet (<http://www.radionet-org.eu>) includes a coherent set of Transnational Access (TA) programs aimed at significantly improving the access of European astronomers to the major radio 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 additional aid from the Transnational Access (TA) Program of 'RadioNet'. 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.

The Transnational Access program is one of the activities of "RadioNet", an Integrated Infrastructure Initiative (I3) funded under the ECs Framework Program Horizon2020, that has pulled together all of Europe's leading astronomy facilities to produce a focused, coherent and integrated project that will significantly enhance the quality and quantity of science performed by European astronomers.

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.

After completion of their observations, TNA supported scientists are required to submit their feedback through the TNA web pages.

Confirming FAST's pulsar candidates using Effelsberg

by Marilyn Cruces & Michael Kramer

The Max Planck Society represented by the MPI für Gravitationsphysik (Albert-Einstein Institute, AEI) and the MPI für Radioastronomie (MPIfR) are launching a major collaboration with the Chinese Academy of Science (CAS). The program will focus on "Low Frequency Gravitational Wave (GW) Astronomy and Gravitational Physics in Space". The program is aiming to establish an intensive long-term partnership, currently organised in four topics: A) Space-based gravitational GW detectors & laser interferometry, B) Radio astronomy technology: from now to the future, C) Gravitational wave astronomy and gravitational physics, and D) Big Data and Big Data Analytics technology and applications. Topics B and C include a number of work packages to conduct joint experiments in radio astronomy, such as joint work on pulsar searching, pulsar timing array experiments, the study of fast radio bursts and also the development of a cryogenic Phased Array Feed (PAF).

As a part of these efforts, we have started to support our Chinese colleagues working at the new, giant FAST telescope. After being completed and having had first light in September 2016, FAST is undergoing commissioning observations. Already at this early stage, our colleagues are producing exciting science by finding new pulsars, demonstrating FAST's unprecedented sensitivity. FAST does not only have a much larger collecting area than any other telescope, but it also uses some innovative techniques: thanks to a system of cables and actuators the otherwise static spherical dish can be deformed to track sources longer than otherwise possible.

The science objectives of FAST range from large-scale surveys of neutral hydrogen, high resolution studies using VLBI, detection of interstellar molecules, pulsar science, to the search for extra-terrestrial life. With our common interest in pulsar surveys and timing, Effelsberg helps to confirm candidates from the on-going drift-scan survey with FAST. Observations of candidates on the Southern Hemisphere are conducted by the Parkes telescope, where MPIfR's IMPRS graduate Andrew Cameron has taken up a joint CAS/ATNF post-doc position to conduct these observations.

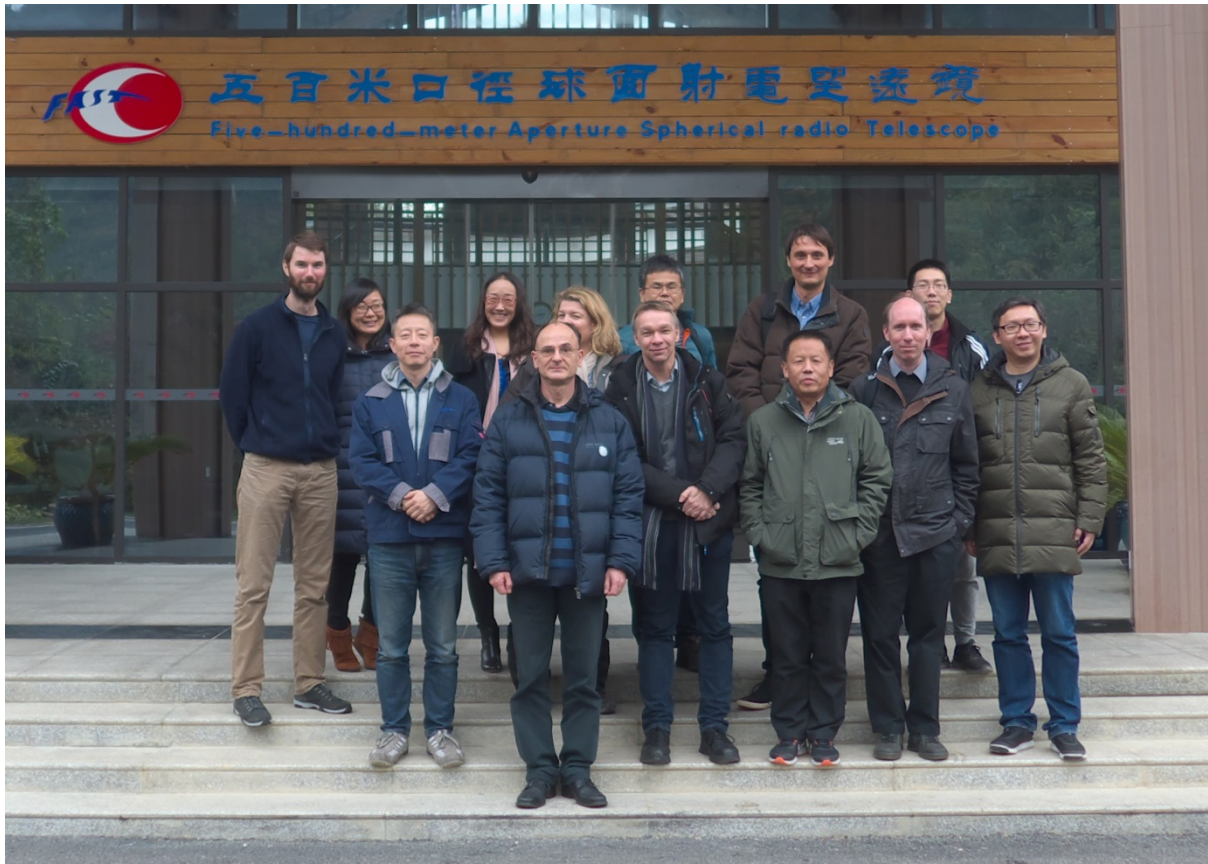
The collaboration between FAST and MPIfR's *Fundamental Physics in Radio Astronomy* group, concentrates in this first stage on the confirmation of pulsar candidates but will later also help to time the pulsars for a better characterisation of their source parameters.

The FAST candidates are observed with Effelsberg at 1.4 GHz with the 7-beam receiver for an observing time that varies from a few minutes to a couple of hours, depending on the type of candidate: whether it is a normal radio pulsar, millisecond pulsar, rotating radio transient, etc., on the estimated flux density of the source, the expected scintillation properties and finally on the existence of a possible companion. At the time of writing, Effelsberg has confirmed two candidates: the 118-ms pulsar J2338+4824 and a 512-ms J0402+4827 pulsar.

The two already confirmed candidates demonstrate clearly that Effelsberg, smaller in size but more agile, can help our colleagues at FAST to exploit future outstanding and intriguing

discoveries. Further joint ventures are planned, such as the establishment of “Über-LEAP”, which will connect FAST with the EPTA telescopes operating in the Large-European-Array-for-Pulsars (LEAP) mode, which will produce the largest pulsar timing telescope on Earth until the existence of Phase II of the SKA.

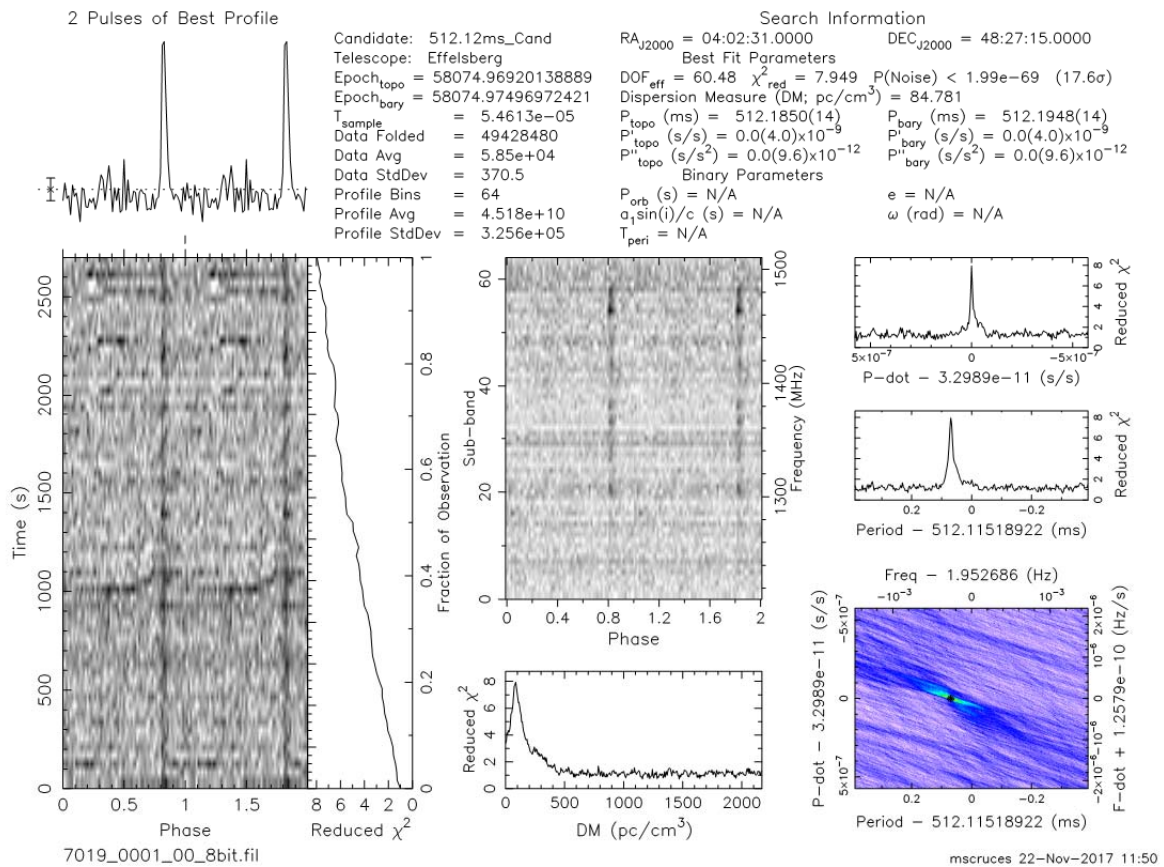
With the additional planned development of PAF technology for Effelsberg and FAST, many more pulsars will be discovered. Here, every single new pulsar has the potential to provide an outstanding laboratory for a wide range of physics, ranging from better understanding the Galactic pulsar population, to tests of gravity or the study of matter under extreme conditions.



Staff members of the MPIfR (David Champion 3rd from right, Gundolf Wieching, 4th from right top, and Michael Kramer, centre) visiting the FAST site. Former MPIfR colleague Weiwei Zhu (right), project lead Bo Peng (below Wieching) and project scientist Di Li (3rd from left) greeted the group, including colleagues from the AEI and German television station ZDF, who reported on the visit.



The impressive sight of the FAST telescope shown to the MPIfR staff by Weiwei Zhu (left), Bo Peng (right) and Di Li (not visible).

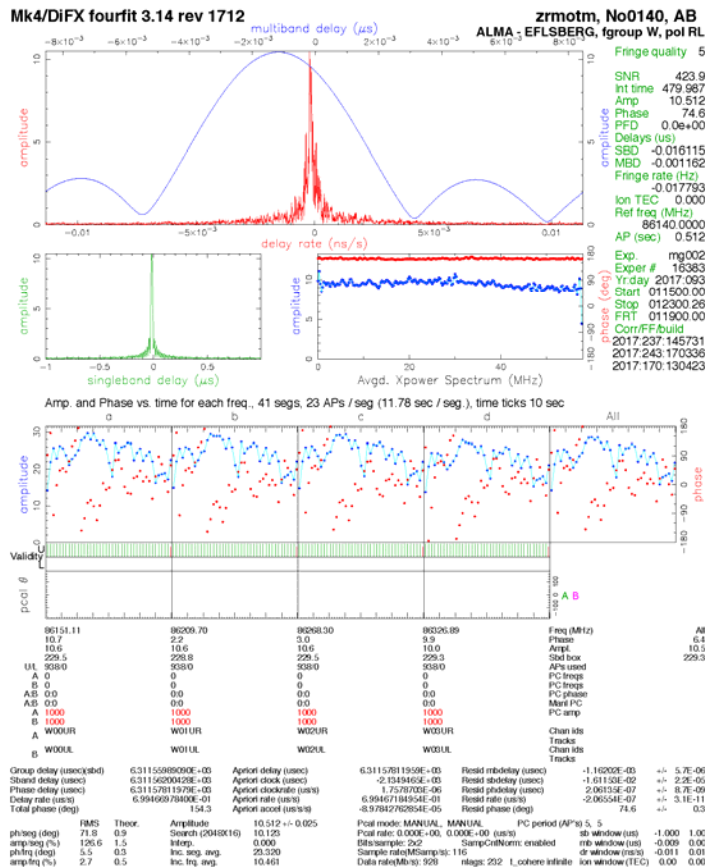


Confirmation observations made by M. Cruces at Effelsberg of the 512-ms pulsar J0402-4827 discovered by FAST.

First VLBI Fringes between Effelsberg and ALMA

(by Helge Rottmann)

The Effelsberg 100-m telescope is one of the key instruments in the Global mm-VLBI Array (GMVA). The GMVA is coordinated by the MPIfR and performs VLBI observations at 3mm wavelengths twice a year.



Using the telescope array astronomers can obtain images with a resolution of a few tens of microarcseconds.

In April 2017 phased-ALMA has joined the GMVA observations for the first time greatly extending the network capabilities in terms of resolution and sensitivity.

The Figure displays a fringe plot of the ALMA-Effelsberg baseline. Despite the separation of the two telescopes of more than 10000 kilometers a correlated radio signal with an SNR of more than 400 was detected.

A detailed report on the involvement of the 100m-telescope in the GMVA will be given in the next issue of this newsletter.

For more information about the GMVA see also:

<http://www3.mpifr-bonn.mpg.de/div/vlbi/globalmm/>

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