

# Effelsberg Newsletter

## January 2010

Max-Planck-Institut für Radioastronomie

<http://www.mpifr.de>

### Message from the Director

Dear Colleagues,

it is a pleasure to welcome you to the first Effelsberg newsletter that will, from now on, accompany every call for proposals for the 100-m radio telescope. The idea is to inform you and your colleagues in a more direct way about changes, opportunities and the science happening at the telescope. We will also use the chance to introduce you to some of the personnel at the telescope and some of the observers, which are the most important part of every observatory. In this issue, we are very happy to feature Simon Ellingsen who traded the Australian summer to the rather cold (and snowy!) winter in Germany. It is also a pleasure to introduce you to Alex Kraus, the station manager of Effelsberg observatory, who always listens carefully if you have questions, suggestions and comments.



Please, also note the funding opportunities for European astronomers provided by RadioNet, the announcement of the first cm-astronomy single dish school at Effelsberg in the autumn, and the upcoming opportunity to apply for large projects. If you have any suggestions, don't hesitate to contact us.

Finally, I wish you a very happy observing in 2010 and the years to come!

Best wishes,

*Michael Kramer*

### Key Science Projects for the 100-m telescope

Starting from the next deadline (Jun 7), the MPIfR accepts observing proposals for Key Science Projects with the 100-m telescope.

Appropriate proposals should deal with high quality science, being uniquely doable with the 100-m telescope, and should be large projects (using between 150 and 500 hours of observing time per year).

Detailed information about the proposing, assessment procedures, etc. can be found in a few weeks time on the web pages of the observatory:

<http://www.mpifr.de/div/effelsberg/proposal/call.html>

*by Alex Kraus*

### Call for proposals – Deadline Feb 8, 2010, 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. With the advent of the new subreflector, observations from the secondary focus (especially at frequencies > 10 GHz) gain from a much higher sensitivity and flatter gain-elevation curves. The new hexapod driving system leads to a faster and more precise focusing of all receiving systems in the primary and secondary focus. 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.de/english/radiotelescope/index.html>

#### Observing modes

Possible observing modes include spectral line, continuum, pulsar, and VLBI. Available backends are a FFT spectrometer (with 8192 channels), a digital continuum backend, a pulsar system (coherent and incoherent dedispersion), and two VLBI terminals (MK4 and VLBA type).

Receiving systems cover the frequency range from 0.6 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.

#### How to submit

*Applicants should use the new NorthStar proposal tool for preparation and submission of their observing requests. North Star is reachable at <http://proposal.mpifr-bonn.mpg.de>. From 2010 on only proposals submitted via NorthStar will be accepted.*

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/prop.html>

Information on proposals for the Global mm-VLBI network can be found at

<http://www.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).

*by Alex Kraus*

## RadioNet Transnational Access Programme

RadioNet (see <http://www.radionet-eu.org>) includes a coherent set of Transnational Access programmes 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.

Observing time at Effelsberg is available to astronomers from EU Member States (except Germany) and Associated States that meet certain criteria of eligibility (see <http://www.radionet-eu.org/transnational-access>). Time on these facilities is awarded following standard selection procedures for each TNA site, mainly based on scientific merits and feasibility. New users, young researchers and users from countries with no similar research infrastructures, are specially encouraged to apply. User groups who are awarded observing time under this contract, following the selection procedures and meeting the criteria of eligibility, will gain free access to the awarded facility, including infrastructure and logistical support, scientific and technical support usually provided to internal users and travel and subsistence grants for one of the members of the research team.

by Alex Kraus

## First prime focus multi-receiver box

In fall 2009, the first prime focus multi-receiver box for the 100-m telescope has been installed.



It contains a new 18/21cm-system (for continuum, spectroscopy, pulsar and VLBI observations), as well as two spectroscopy receivers (1.9cm and 1.0cm). In addition, a 2.5cm-receiver for holography of the reflector is included. Switching between the individual systems is done by rotating and shifting the box into the focus position and can be done within one minute.

The picture shows the receiver in the lab.

Details about the receiver capabilities are given on the homepage <http://www.mpifr-bonn.mpg.de/div/effelsberg/>

## European Single Dish School in Bonn & Effelsberg

September 27 to October 1, 2010

The first European cm-Astronomy Single-Dish School will take place from September 27 to October 1, 2010 at the MPIfR in Bonn and Effelsberg. This school will provide information on the theoretical background as well as on practical matters of radio astronomical observations with a single dish telescope. The school is dedicated mainly to graduated students and PostDocs in astronomy.

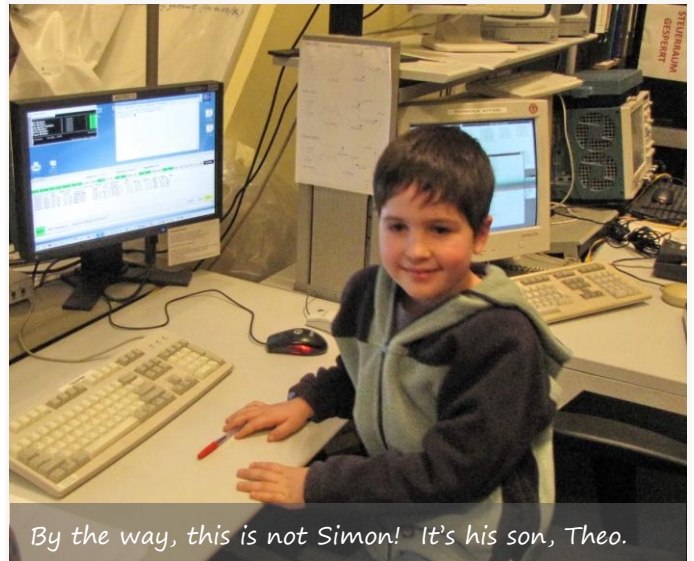
Detailed information can be found soon at

<http://www.mpifr.de/div/effelsberg/SummerSchool/Main.html>

by Alex Kraus

## Interview with an Effelsberg Visitor

Dr. Simon Ellingsen



Could you please tell us briefly about yourself?

I did my PhD on (the then newly discovered) 6.7 GHz methanol masers under the supervision of Ray Norris (ATNF) and Peter McCulloch (UTAS), graduating in 1996. I've continued to work in high-mass star formation, primarily through observations of methanol masers. Recently my focus has been on using the presence and absence of different maser transitions to produce an evolutionary timeline/clock for high-mass star formation. I've also done some work on water megamasers, particularly the rapid scintillation induced variability seen in the Circinus megamaser. I'm currently senior lecturer in the School of Mathematics and Physics at the University of Tasmania. I divide my time between teaching undergraduate physics, supervising graduate students, research and looking after our radio telescopes. For the last 6 months I've been on sabbatical with the Menten group at the Max Planck Institute für Radioastronomie.

What was the motivation to spend your sabbatical in Bonn and to use Effelsberg?

There were several factors, first and foremost was the desire to spend 6 months working with people in the Menten group. In astronomical terms the University of Tasmania is small and fairly isolated, so it is nice to spend sometime where there are lots of people working in the same field and to be able to interact with them day to day. I also wanted to come to Bonn/Germany for cultural reasons, it was an opportunity for the family to spend sometime in the middle of western Europe and experience life in a non-English speaking country.



More Snow than in Australia ....

The observations I undertook with Effelsberg are a little different to much of the work I do in star formation. I was monitoring the water megamaser emission in NGC3079, looking for rapid variability. Along with Jamie McCallum I have been involved in a number of projects looking at rapid (timescales of 10s of minutes), large amplitude variations in the water megamaser emission from the Circinus Galaxy. The observations we have made suggest that this variability is due to diffractive interstellar scintillation, which is interesting because this is normally only observed in pulsars at frequencies less than about 2 GHz. Definitively proving the scintillation hypothesis in Circinus has been difficult though because the masers evolve too rapidly to provide a simple annual cycle and we haven't been able to measure a time delay because there aren't two sufficiently large (>60 m diameter), sufficiently well separated telescopes (> 3000 km) which can observe a source at -65 degrees (the declination of Circinus). Recently Wouter Vlemmings observed similar rapid variability in NGC3079 with the GBT using their dual beam 22 GHz system. Our observations with Effelsberg were to try and detect this variability with standard position-switched observations. From our observations of Circinus with the Tidbinbilla 70m we have developed a number of special technics for removing the effects of small gain variations due to small changes in pointing and atmospheric conditions.

What was the project that you were working on during your time in Bonn?

I worked on a number of projects. My original intention was to focus mainly on the analysis of some methanol maser parallax VLBI observations I have been making with the Australian Long Baseline Array. I have spent sometime on that, but what was originally intended as a small paper on 12.2 GHz methanol masers in the LMC ended up growing significantly. We have been using Spitzer SAGE data and SED modeling to characterize the properties of maser-associated YSOs in the LMC. The maser-associated YSOs are in general younger and more massive than the majority of those which are not. More recently I have been working on the NGC3079 observations made with Effelsberg.

What is your experience being in Bonn and observing in Effelsberg?

I've very much enjoyed my time in Bonn. Its nice being able to go to a couple of interesting talks every week and hearing about the work being done by others in the group. In particular the people in the Menten group have been very welcoming and helpful in all sorts of ways, which has made a big difference to our time here. My observing at Effelsberg went very well from an observational perspective and thanks to lots of help/support from Alex Kraus and his team, my family who accompanied me also had a great time. My daughter had her fifth birthday while we were there and the weather cooperated by providing snow.

Were your observations successful and can you already describe the results?

We had very good weather for 22 GHz observations, it was cold and (mostly) clear, we lost a few hours due to snow. We had hoped for some strongish, isolated maser features to make our task easier, whereas in the end the source was a little weaker than is normally observed and all the strong emission is in a small and heavily blended velocity range. Despite the intervention of Murphy's law our preliminary analysis shows that we have detected significant relative variations between different features in the spectrum. We are currently working on the calibration of the short-timescale pointing/weather related gain changes and will start looking at the timescale and spectral properties of the relative variations soon.

How did your family find the time in Bonn?

They have all had a really good time and enjoyed the traveling around Germany and nearby countries we have done on the weekends and holidays. My two older children have been attending the Montessori Grundschule near where we have lived in Dottendorf and the younger one went to kindergarten. They have

found school quite different here in Germany from Australia. They have learnt lots of new things, and although they are far from fluent in German, they have made some good friends.

What is the best memory of your stay in Bonn?

Its hard to single out just one memory from our time here. A few months ago I went to an FC Köln vs. Schalke Bundesliga game with my two sons. The atmosphere at the stadium was great and we all really enjoyed the game (even if Köln didn't manage a win). Also in November, all the children were involved in the St Martin's Day Parade. This was something completely new to us and we really enjoyed the spirit of the celebrations. The children had a lot of fun going around after the parade singing and getting treats. They hadn't learnt the traditional St Martin's song though and so sung Waltzing Matilda instead - which surprised some of the locals.

We hope to see you soon again...

by Busaba Kramer

## Meet the Station Manager



**Alex Kraus** studied Physics and Astronomy between 1988 and 1994 at the University of Bonn and the Swiss Federal Institute of Technology in Zurich. For his diploma (1994) and PhD thesis (1997) he investigated the phenomenon of Intraday Variability in Active Galactic Nuclei. Since 1998 he belongs to the scientific staff of the MPIfR. In April 1999 he joined the staff of the Effelsberg observatory as

support scientist. Since 2003 he acts as scheduler for the 100-m telescope.

In February 2006 he succeeded Ernst Fürst on the position as station manager of the Effelsberg observatory. To his scientific interests belong variability studies of AGN as well as the improvement of the calibration of radio telescopes, especially of polarization observations.



Effelsberg – A winter wonderland

## Contact the Editor:

**Busaba Hutawarakorn Kramer**

Max-Planck-Institut für Radioastronomie, Auf dem Hügel 69, 53121 Bonn, GERMANY

Tel: +49 (228) 525-377 Fax: +49 (228) 525-229

Email: bkramer@mpifr.de