IVS Newsletter

Issue 21, August 2008

Host Institutions for Combination Centers and Analysis Centers Sought

– Dirk Behrend, NVI, Inc./GSFC

The IVS Directing Board issued a call soliciting proposals for the installation and operation of IVS Combination Centers and additional Analysis Centers (Operational ACs and Associate ACs). The existing Associate Analysis Centers are encouraged to apply for becoming Operational Analysis Centers. The calls are posted on the IVS Web site at:

http://ivscc.gsfc.nasa.gov/about/org/components/Call4ComC.txt

http://ivscc.gsfc.nasa.gov/about/org/components/Call4OpAC.txt

The deadline for proposals is 1 September 2008. Successful proposers will be notified by October 2008.

Proposals can also be submitted at any time after the given deadline. The IVS Directing Board will review those proposals in due time.

Board Elections on the Horizon

– Dirk Behrend, NVI, Inc./GSFC

Every two years, the IVS holds Directing Board elections in order to reoccupy positions of members whose terms end. The next term changeover is on the horizon with six positions to be filled by the end of February 2009. Three representative positions are to be re-elected:

- Analysis and Data Centers Representative (now Arthur Niell),
- Technology Development Centers Representative (now Bill Petrachenko), and
- Networks Representative (now Kazuhiro Takashima).

In addition, the three at large positions (Andrey Finkelstein, Xiuzhong Zhang, Oleg Titov) are to be refilled. The representative positions are elected for 4-year terms, whereas the at large positions are for 2-year terms. Arthur Niell and Bill Petrachenko are not eligible for re-election.

The Election Committee (Alan Whitney, Hayo Hase, Dirk Behrend) will send a call for nominations by early November. You may already consider who among your colleagues could take over a position in the IVS Directing Board.

Only persons who are currently IVS Associate Members may be nominated for any position. Please check that the list of Associate Members is complete and up-to-date for your component.

First IVS Chair Ends His Working Career

Wolfgang Schlüter receiving presents during his retirement party in the "barn" at the Geodetic Observatory Wettzell.

After 25 years at Wettzell, former IVS Chair (1999–2007) Wolfgang Schlüter retired from his position as Directory of the Geodetic Observatory Wettzell and ended his working career. He celebrated his retirement party during the FGS Workshop 2008, which was held in Bad Kötzting, Germany, from July 16–18, at the premises of "his" observatory. About 130 people came together to say farewell to Wolfgang and to wish him all the best and good health for the future. Wolfgang, we will surely miss you.

-db

Permanent Component

Geodetic Observatory Wettzell, Germany

The Geodetic Observatory Wettzell, jointly operated by Bundesamt für Kartographie und Geodäsie (BKG) and Forschungsgruppe Satellitengeodäsie of TU Munich, is located in the Bavarian Forest in Germany and is one of the few fundamental stations that currently exist in the world. With over 130 24-hour sessions observed per year and participating in all Intensive sessions, it is the busiest station within the IVS. Newsletter Editor Dirk Behrend interviewed VLBI station chief Alexander Neidhardt to get an insight into the current activities and to learn about plans for the future.

Alexander, you are the successor to Richard Kilger as VLBI station chief at Wettzell. Your background is informatics. How did you end up doing VLBI?

(above) VLBI station chief Alexander Neidhardt at his desk. (below) The Wettzell VLBI crew (from left to right): Christian Plötz, Erhard Bauernfeind, Gerhard Kronschnabl, Raimund Schatz, Walter Schwarz, Reinhard Zeitlhöfler, Alexander Neidhardt (missing in picture: Ewald Bielmeier).

I studied computer science at the University of Applied Science Regensburg and the University of Erlangen-Nuremberg. During that time I worked as working student at the observatory. So I had the first contact to the scope of duties around geodetic instruments like laser ranging telescopes. After my studies I got the possibility to work as PhD student at the observatory and had first contact with the radio telescope group while supporting some IT accessories. My current job is to develop the remotely assessable and automated control system for the new laser ranging system at Wettzell. With information technology becoming more and more relevant in combination with e-VLBI and remotely controlled measurements, I tried to become a candidate for the vacant position as chief of the VLBI group after Richard Kilger retired. And I got the job! This means that I have to learn a lot of new things, but I also hope that I can support the changes concerning e-VLBI equipment with my background.

Can you shortly introduce the current VLBI crew and their responsibilities?

The VLBI team consists of eight members and is therefore the biggest group at the Geodetic Observatory Wettzell. My proxy is Gerhard Kronschnabl who managed the group as intermediate chief until now. Together with Walter Schwarz and Reinhard Zeitlhöfler, he is responsible for the high frequency technology, the electronics, and the computer hardware. Erhard Bauernfeind handles the cryo system; he handles everything pertaining to the cooling and vacuum techniques and the mechanics. Raimund Schatz does the scheduling preparation and some script administration. Ewald Bielmeier is our electrician. And last but not least, Christian Plötz mainly runs the VLBI experiments and campaigns at the German Antarctic Receiving Station O'Higgins and is involved as electronics engineer. And I will try to bring in my knowledge about computers and IT especially for e-VLBI, automation, and remote control.

Will the operational work at Wettzell be shifted towards e-VLBI/e-transfer?

e-VLBI is the future and the upcoming requirements will only be manageable and payable when more and more experiments are sent via direct dark fiber and Internet links. The cycle times will increase and the time-to-product will become more and more important. So Wettzell will have to improve the current situation. At the moment we send the data of the Intensive sessions with a time delay to the correlators (e-transfer). Wettzell has just a 620 MBit/sec line, so that the transfer is limited. Maybe the future can offer new techniques to solve the last mile problem. But in general, these techniques are just useful when also other telescopes and also the correlators are able to send and receive the data on time. For Wettzell the next steps will be to fully load the current Internet link, for example by running real-time Intensives, where the data are sent directly from the local system to the correlators.

Wettzell is working on the so-called TWIN Telescope. What is your involvement in this project? What are the plans?

I am very new in this project. Because of that I will have to take root first. But due to my supporting work within former projects, I was able to collect a lot of experience. So I take part in the planning discussions and can bring in my knowledge of IT, especially in combination with necessary requirements for e-VLBI, automation, and remote controlling or the server techniques for the so-called Green IT. The TWIN Telescope project itself will be the door to new possibilities and should guide VLBI at Wettzell into the coming decades following the suggestions of the VLBI2010 report. It will offer two small, fast moving, state-of-the-art antennas, which should be able to deal with upcoming requirements such as other frequency bands and so on. But it is a difficult way, comparable to the years when our current 20-m telescope was built.

Wettzell is a fundamental station with several co-located geodetic space techniques. Do you also work in one of the other techniques? What is your part there?

In general I come out of the laser ranging field. As software developing engineer I'm involved in the development of the remotely controllable and automated controlling system for the new Satellite Observing System Wettzell and I wrote the data management and some hardware controlling parts for the current Wettzell Laser Ranging System. During the finishing phase of the new system my colleagues and I will have to bring up the system into operational state. And also for maintenance needs of my written software, it could be a benefit that at Wettzell we have close links among each other; so I can help in some cases when there are problems.

How did you handle the change-over from Richard Kilger? Is Richard helping out at times?

Gerhard Kronschnabl managed a smooth change-over. He was the acting chief before the successor contract was wrapped up. During that transition time I already had good contact to the group and to Gerhard, so that the changes were not too hard. It is sort of a giving and taking, where I have to learn a lot about the technique and the group structures and the group can count on me representing it to the outer world. I always had a good contact to Richard, already when he was the chief of the group. And last January/February it was planned to do an Antarctic VLBI campaign together, which I had to cancel because of bad weather and flight conditions, so that Richard ran the experiments alone. All this means that he is still involved in VLBI, either at the Antarctic station or as consultant for the TWIN Telescope. But the times at Wettzell change so fast—for example in combination with e-VLBI—that Richard mentioned that his former control room at Wettzell now looks totally different.

With Wolfgang Schlüter also the Director of Wettzell is retiring and a successor will soon be determined. Do you expect any changes in the running of the station or in the VLBI operations?

Each change will have some effects with negative and positive elements. On the one hand, a very successful era of 25 years with Wolfgang comes to an end, during which Wettzell gained wide recognition within the geodetic services. On the other hand, it is the time for new ideas and a new, fresh wind. We will have to wait and see what the changes will bring. The work itself remains the same and will be done in the same stable and reliable way known from Wettzell as a partner in the international services. And for VLBI and also the other techniques, the course is set for a hopeful and future-oriented way, for example with the TWIN-project, so that we are not afraid of the coming times.

Wettzell is one of only a handful of fundamental stations in the world. The Global Geodetic Observing System (GGOS) aims at establishing 40 globally distributed fundamental stations. What role can Wettzell play? What importance has GGOS for Wettzell?

GGOS at the moment consists of many plans and constitutes a good opportunity to raise the awareness for the importance of geodetic infrastructure. I'm thinking of climate change or disaster management for which geodesy offers the elementary reference frames. But the plans have to be realized and so we talk about time periods of 5 to 20 years. At Wettzell we are in the excellent position to already have a complete, working, and globally accepted fundamental station. So we have the knowledge and with all our new projects, where we develop and plan a lot of components ourselves, the basis to offer functional and payable example realizations like the TWIN telescope or the new laser ranging system. We can give a helping hand in dealing with the local surveys, timing distribution, or things like that, which are really important for fundamental stations. So Wettzell can offer a lot of possibilities and it is my opinion that Wettzell will also be a reference point within the future Global Geodetic Observing System.

(above) An aerial view of the Geodetic Observatory Wettzell including the site for the planned TWIN Telescope (TTW). (below) Wettzell's 20-m radio telescope.

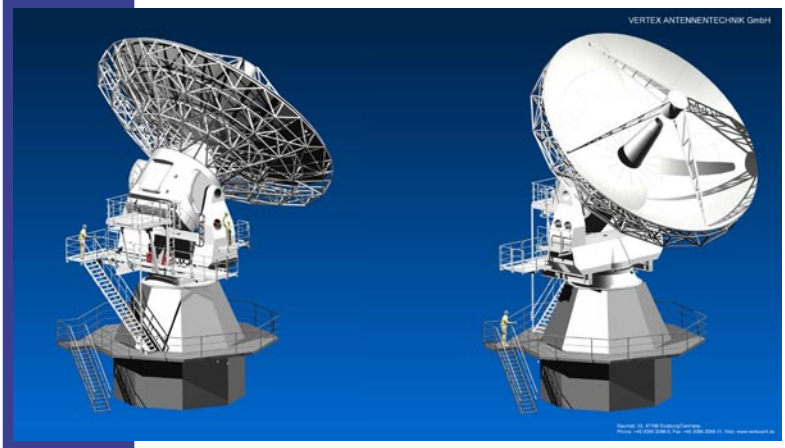
What is the level of involvement of students (e.g., from the TU Munich) and young scientists at Wettzell?

Within the new created, international master courses, in which I'm partly involved for teaching, there is a good contact to students where we can also include practical elements from work at Wettzell. In some cases some students become interested in geodetic work and do their master thesis at Wettzell. Still, because of the distance to Munich it is not so easy. But there is another university at Regensburg. And especially the students of the University of Applied Science are really interested in practical work, because they have to run internships. And some of these young scientists can be recruited to work project-oriented in our new projects after their studies. It's always a give-and-take, but in general it is useful and helpful for both sides.

VLBI2010: An Update

– Bill Petrachenko, NRCan, VLBI2010 Committee Chair

It's amazing how fast time flies! It is already two and a half years since the first organizational meeting of the VLBI2010 Committee (V2C). For those that were there, you will remember that it took place in a small meeting room of the Hotel Diego de Almagro at the IVS GM in Concepción, Chile. Since we are about half way between then and the year 2010, this is a good time to look back and summarize the work and conclusions so far. We have come a long way!



Artist's rendition of BKG's Twin Telescope Wettzell. In this project two identical 13.2-m ringfocus radiotelescopes will be rigorously realized according to the IVS VLBI2010 vision at Wettzell. The duration of the project is set to 2008-2011. The main contractor is the company Vertex Antennentechnik GmbH in Germany, which holds also the copyright in the image.

Nearly immediately after the start of the V2C, work began to develop Monte Carlo simulators to predict the effectiveness of new strategies to improve VLBI performance. Simulators were built at both TU Vienna and GSFC, and the critical atmosphere models and constants were generated at Onsala. These packages have been under nearly continuous improvement since then and have been used to study a wide range of phenomena. As a result, a consistent picture is now emerging of optimal VLBI2010 operating modes, and this in turn is driving the specification of VLBI2010 subsystems.

Although many strategies were studied with the simulators, increasing the number of observations per session appears to be the most powerful means for improving VLBI performance towards the 1 mm target. According to the simulators, the combined effect of new analysis strategies and reducing the average source-switching interval from 6 minutes to 1 minute reduces position error roughly from 8 mm (the approximate current level of performance) to about 1.6 mm, and a further reduction of switching interval to 25 seconds improves performance down to about the 1-mm level.

For obvious reasons, the new requirement for short source-switching intervals poses significant challenges for the specification of the VLBI2010 antenna and receiver system. In order to get source-switching intervals below the 1-minute level, it is clear that both the on-source time for integration and the between-source time for slewing must be very short—the former pushing for a larger and the latter for a smaller antenna. The eventual VLBI2010 compromise is an antenna of minimum diameter of 12 m with the required sensitivity being achieved through the use of high data rates (16−32 Gbps) and burst mode acquisition, where data are acquired at full rate while the antenna is on source and written more slowly (4−8 Gbps) to disk while the antenna slews to the next source. In terms of slew rate, achieving a switching interval of 25 s requires a dish with azimuth slew rate of at least 12 deg/s, or a pair of dishes with azimuth slew rates of 5 deg/s. Although these slew rates may sound intimidating compared to existing antennas, a contract has already been let for a pair of antennas with 12 deg/s azimuth slew rate for the Wettzell Twin Telescope Project, and Australia and New Zealand have both let contracts for antennas with 5 deg/s azimuth slew rate. These contracts herald the beginning of the VLBI2010 era.

These simulation results promising near-1-mm performance are clearly encouraging. However, a little realism is needed to temper expectations. First, the 1-mm results are based on simulations. Although we have tried our best to use realistic models, it is likely they are not perfect. It would be more reassuring if there was a little more margin in our predictions. Second, the Monte Carlo simulators only consider random errors (due to the atmosphere, clocks, and delay measurement), with systematic errors ignored. As a result, a second major effort of VLBI2010 is to reduce systematic errors.

Three serious sources of error in VLBI are instrumental drifts, antenna deformations, and source structure. Although techniques are currently applied to handle each of these, improvements are required to achieve 1-mm performance, especially to attain long-term stability at that level. In this regard, phase calibration and cable delay monitoring are both being reviewed. Pulse generators, pulse repetition rate, injection points, detection methods, among others, are all being reconsidered with VLBI2010 in mind, and completely new ideas for cable delay measurement (or stabilization) have been proposed.

While classical techniques for monitoring and modeling antenna deformation continue to be refined, at least one completely different approach is being considered. The new concept involves observing GPS signals along exactly the same ray path as the VLBI signal. Since any deformations of the VLBI antenna structure will affect the GPS signal in exactly the same way, it will be possible to use connected-element interferometry to transfer the effective reference point of the VLBI antenna (which is unstable due to thermal and gravitational deformations) to the stable reference point of a small directional GPS antenna.

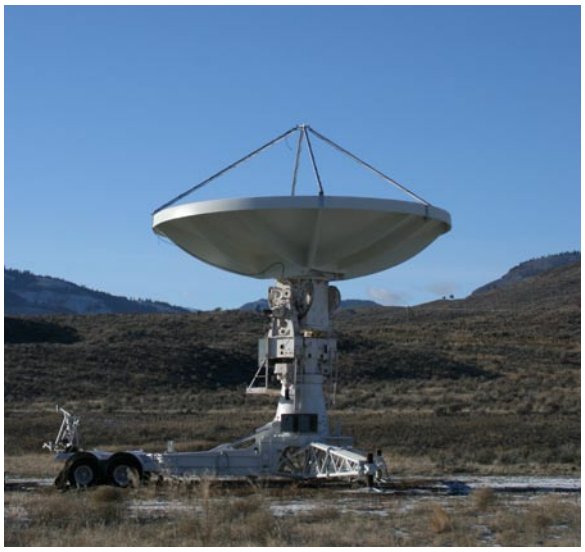
As far as source structure is concerned, careful monitoring programs over the past decade have allowed refined low-structure source lists to be compiled. But more exciting, the new switching rates and larger global networks proposed for VLBI2010 greatly increase UV coverage for the sources observed, hence making the routine application of active source structure corrections directly from the VLBI data a real possibility. Simulations are currently underway to investigate this approach. In addition to adding stability to the celestial reference frame (CRF) for astrometric and geodetic purposes, this approach will also provide a valuable new time-lapse record of core-jet structures.

In terms of technology, this is a truly amazing time to be alive! Moore's Law continues to apply to almost all areas of digital electronics and communications including CPUs, memory, logic, disks, and fiber optics. Cost-effective high-resolution samplers are now available beyond 2 gigasamples per second, next generation disks will have multi-terabyte capacities, FPGAs improve every year, and so on and so forth. All of these capabilities are currently being incorporated into next generation VLBI systems. A phenomenal amount of data quality analysis and calibration is being planned for VLBI2010: interconnects between systems will be handled by fiber, signals will be transmitted from the antenna to the control room by fiber, and software correlation is a real possibility.

In addition to the theoretical work being done in support of VLBI2010, a very significant development effort is being supported by NASA and carried out at Haystack Observatory and GSFC. Two complete VLBI2010-style systems have been developed, one for the Westford antenna at Haystack Observatory and the other for the 5-m GGAO antenna at Goddard. First fringes with a single band version of the system were detected on May 23, and full 4-band systems will be tested shortly after the CONT08 observations in August. The purpose of this development effort is to demonstrate the concept of broadband delay. Broadband delay is another major innovation of VLBI2010 and involves the use of a large number (4 in this case) of bands (0.5 GHz bandwidth) spread optimally across a very broad frequency range, e.g., 2−14 GHz. The purpose is to unambiguously resolve the RF phase and hence improve the delay measurement precision by about an order of magnitude. In addition to the important proof-of-concept objective, this effort is providing very valuable hands-on experience with the next generation systems and operating environments. This experience will be invaluable for the final system designs.

As you can see, much has been achieved in the first two and half years of the V2C, all the way from theoretical studies to sub-system specification, and even the development of real systems. All the people involved in this effort should be proud of the progress that has been made thus far. This is a very exciting moment to be involved in geodetic VLBI!

Acknowledgement. I would like to point out that the VLBI2010 work reported here is the product of a very large number of capable people. Unfortunately, the list is too long to mention each person individually, but it goes without saying that each and every contribution is important to the final outcome.



Prototype design of a composite antenna at DRAO in Penticton, Canada. The 10-m dish of this composite antenna was placed on the MV-1 antenna mount (formerly at Yellowknife).

Additional Copies of 2007 Annual Report

The Coordinating Center has additional copies of the 2007 Annual Report available. If you are interested in receiving an additional copy, please send your request to Dirk Behrend (Dirk.Behrend@nasa.gov).

The IVS Newsletter is published three times annually, in April, August, and December. Contributed articles, pictures, cartoons, and feedback are welcome at any time.

Please send contributions to
ivs-news@ivscc.gsfc.nasa.gov.
The editors reserve the right to edit contributions. The deadline for contributions is one month before the publication date.

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The newsletter is published in color with live links on the IVS web site at http://ivscc.gsfc.nasa.gov/.

NEWS...

SHAO Hosts 7th International e-VLBI Workshop

– Tao An and Xiuzhong Zhang, Shanghai Astronomical Observatory

Following the successful workshops held at Haystack (2002), JIVE (2003), Tokyo (2004), Sydney (2005), Haystack (2006), and Bonn (2007), the 7th International e-VLBI Workshop was held in Shanghai, China on June 16−17, 2008, followed on June 18 by a half-day visit of the Sheshan 25-m radio telescope. It was organized and hosted by the Shanghai Astronomical Observatory (SHAO) of the Chinese Academy of Sciences (CAS). The Express Production Real-time e-VLBI Service (EXPReS), the CAS, and the National Natural Science Foundation of China (NSFC) generously provided financial support for the workshop.

The participants of the 7th International e-VLBI Workshop gathered in front of the main building of Shanghai Astronomical Observatory on June 16.

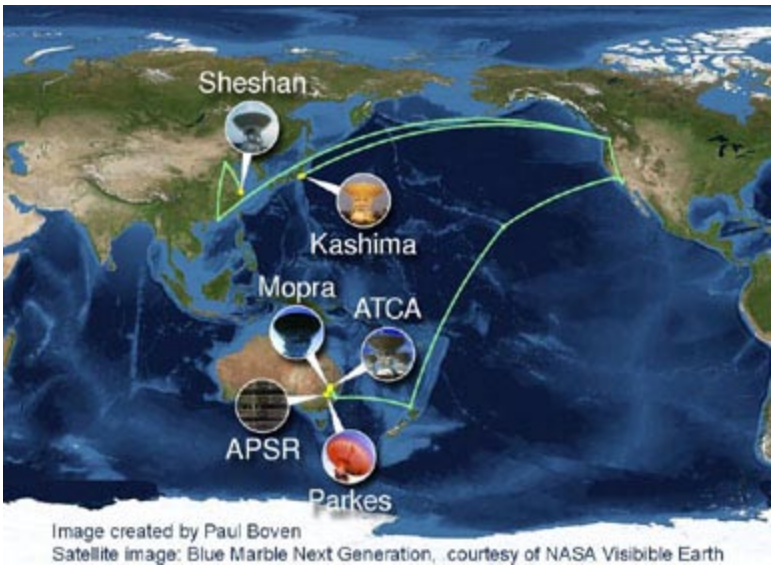
A total of 87 participants from 11 countries registered for this annual workshop, bringing in 27 oral and 6 poster presentations. Astronomers reported on the progress and on-going projects of e-VLBI facilities around the world, shared the latest scientific results, and exchanged technical development in formatter, data recording equipment as well as hardware/software correlators, among other topics. Network people demonstrated the Internet connectivity in Asia, Australia, Europe, and the US, contributed many ideas on e-VLBI infrastructure, and took part in the e-VLBI demo experiments. All presentations have been put online at http://www.shao.ac.cn/eVLBI2008/presentation/. At the end of each day a panel discussion was held following the presentation sessions. On June 16, the discussion focused on funding and organization. On June 17, a lively discussion took place about data formats, transfer protocols, and related issues. The attendees agreed on establishing a task force to work on the standards for e-VLBI data and protocols.

The workshop featured two e-VLBI demonstrations. The first demonstration (e-CVN demo) on June 16 involved the Chinese VLBI Network that consists of four telescopes (Sheshan 25m, Urumqi 25m, Beijing 50m, and Kunming 40m) and the (software/hardware) correlators at SHAO. It demonstrated the near real-time VLBI mode that was used in the VLBI tracking of the Chang'E-1 satellite during its flight to the moon in October 2007. The other demonstration (e-APT demo) was carried out with international astronomical facilities Sheshan 25m (SHAO), Kashima 34m (NICT), Parkes 64m (ATNF), Mopra 22m (ATNF), and ATCA 5x22m (ATNF), the DiFX software correlator at Parkes, and the networks CSTNET (China), AARNet (Australia), JGN2plus (Japan), and CENIC (USA). In the e-APT demo, data were streamed from Kashima, Parkes, Mopra, and ATCA at a rate of 512 Mbps, data from Sheshan at 256Mbps. The network connection from Sheshan to the Parkes correlator worked at 512 Mbps, as had been verified from network connection tests before the demo. However a problem, suspected to be within the DiFX software, prevented rates higher than 256 Mbps working with Sheshan. The reason is being investigated. The antennas, networks, and correlator ran successfully during the 12-hr observations. A number of AGNs and a recent gamma-ray burst were observed. Before the end of the demo, an image of an AGN was created and displayed to the audience.

The workshop provided an opportunity to strengthen both international and regional cooperation in e-VLBI activities. Sheshan Station demonstrated the capacity of 512 Mbps. The networks CSTNET, AARNet, and JGN2plus have closely worked together with astronomers from Sheshan Station, Kashima Station, and ATNF to test international connections and to support the e-VLBI demo. We will further push ahead with the 622 Mbps link to the Urumqi 25-m telescope for testing e-VLBI experiments with Urumqi.

The workshop was rounded out by a visit of the Sheshan 25-m radio telescope on June 18. Despite heavy rain, a good number of workshop attendees gathered in the morning and enjoyed a tour of the telescope.

The Director of Shanghai Astronomical Observatory Xiaoyu Hong welcomed the participants before the first session.



(above) The lightpath for the e-APT demonstration on June 17.(top right) Alan Whitney and Richard Hughes-Jones chaired the first panel discussion. (lower right) The e-APT demonstration was introduced by Chris Philips (center).

Physical Frailty of IT Hardware Impacts VLBI

–Ed Himwich, NVI, Inc./GSFC and Jonathan Quick, HartRAO

Recent experience at Goddard's Geophysical and Astronomical Observatory (GGAO) brought to light that not only the human body suffers from physical frailty. It also extends into the realm of IT hardware. While trying to upgrade the FS computer of GGAO, the hard disks of the original computer and then subsequently of the backup machines died in the process. The worst case scenario was almost complete. Only a short-term resuscitation of one of the disks averted Murphy's complete victory.

If you have a FS computer five or more years old that you are planning to upgrade to a new Linux distribution, you should consider carefully whether it is prudent to do so. These older computers, particularly those with disks of a similar age, are under increased risk for developing disk failures when they are upgraded. The mechanism for this is not entirely clear. It appears that over time the disks become frail with age (a situation that may be familiar to owners of middle-aged human bodies). The installation of a new operating system (OS) may stress the disks in unaccustomed ways. This may cause them to fail either immediately or after some time, but sooner than they would if not upgraded. If your computer is five or more years old and you are planning to install a new Linux distribution, such as Field System Linux 7 (FSL7), it would be prudent to consider instead either replacing your computer or at least buying new disks. Depending on the age of your computer and the type of disks, a replacement computer may be more cost effective than new disks.

Further, it is typical that computers and disks five or more years old are starting to show their age. They are more likely to fail in general. Replacement components for repair may be becoming harder to find. The computer's performance may be reduced by the apparently ever increasing weight of new OSs. When your FS computer reaches five years of age, or possibly before, we recommend that you consider how and when to replace it. An old computer can be safely retired to other less critical functions and/or serve as a spare FS computer. It is of course advantageous to have such a spare available.

Upcoming Meetings...

Journées 2008 Dresden, Germany September 22-24, 2008	IVS Analysis Workshop Bordeaux, France March 25-26, 2009
9th EVN Symposium Bologna, Italy September 23-26, 2008	EGU General Assembly Vienna, Austria April 19-24, 2009
AGU Fall Meeting San Francisco, USA December 15-19, 2008	5th IVS TOW Haystack Observatory Westford, MA, USA April 27-30, 2009
19th EVGA Meeting Bordeaux, France March 24-25, 2009	

http://ivscc.gsfc.nasa.gov/meetings

NEWS...

FAGS To Be Merged with WDC to Form WDS

– Dirk Behrend, NVI Inc./GSFC

Logo of the Federation of Astronomical and Geophysical Data Analysis Services (FAGS). http://www.icsu-fags.org/

The Federation of Astronomical and Geophysical Data Analysis Services (FAGS) and the World Data Centers (WDCs) are both interdisciplinary bodies of the International Council for Science (ICSU). As IVS Newsletter has reported (issue 12), about four years ago ICSU (through its Committee on Scientific Planning and Review, Panel Area Assessment on Scientific Data and Information) suggested the discontinuation of ICSU's support for FAGS. This recommendation, however, was overruled by the ICSU General Assembly in October 2005, and ICSU extended its sponsorship of FAGS for a period of three more years. During this 3-year period, FAGS was working on establishing new arrangements within ICSU for data coordination and continued to fulfill its role of coordination among member services. At the same time, ICSU examined integration of the coordination function within its activities in data and information.

The FAGS work over the 3-year period culminated in a white paper "Towards a New Structure for Federating Astronomical and Geophysical Data Analysis Services". In parallel, the WDC undertook similar efforts. In 2007, ICSU then formed an Ad-hoc Strategic Committee on Information and Data (SCID) in order to guide and oversee the reform of the WDC and FAGS; both WDC and FAGS were represented in the SCID committee. SCID prepared a report, which recommends, among other things, the establishment of a World Data System (WDS) as a merger of the current WDC and FAGS. The recommendation needs to be approved by the ICSU General Assembly in October 2008, but to all appearances this is only a formality. The merger is anticipated to happen around the middle of 2009, and a WDC-FAGS Transition Team was created and will pave the way for a smooth changeover.

The IVS will have to apply to become a member of the new WDS; there is no automatic rollover planned. First, however, the IVS Directing Board will have to discuss the WDS membership and give its go-ahead. A feature of the WDS will be an accreditation process for its members. Hence, a member of WDS can be considered as having obtained the scientific stamp of approval from ICSU. The WDS will implement a quality control of the centers and services, thus ensuring a quality standard across the WDS components. By combining the efforts of its component parts, the ICSU WDS will be able to promote their individual and collective capabilities more widely.

A lot of work was put into making the establishment of the WDS possible. On the FAGS side this work rested mostly on the shoulders of Nicole Capitaine, Ruth Neilan, Philip Woodworth, and Niels Andersen. Without their dedication, the story might have taken a different turn.

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