Welcome Speech by Dr. Michael Garrett (Director JIVE)

Joint Institute for VLBI in Europe (JIVE),
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www.jive.nl

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It is my great pleasure, as the director of JIVE to host this event and to welcome you all to Dwingeloo. In particular, I would especially like to thank Commissioner Potočnik and Minister van der Hoeven for being present here today; it is a great honour for JIVE and I believe it reflects the importance that they each attach to the development of large-scale research infrastructures in astronomy, on both a national and international scale. It is also a pleasure to welcome Robert Jan Smits and his team from the European Commission. Most of all I would like to thank all the journalists who have made the long trip to be with us here today – the number of foreign and national press now present in this building is a sure measure of the high interest the European public attach to astronomy – in its scientific, cultural and technological dimensions.

I'd like to begin by giving a brief introduction to JIVE and describe what it is that we do here. The mission of JIVE is to support the European VLBI Network (EVN) in the broadest possible sense. This is a considerable challenge; the EVN consists of 14 institutes operating 16 of the largest radio telescopes in the world, located across Europe and beyond, including China, South Africa and Puerto Rico, USA. In addition, we regularly co-observe with the MERLIN array in the UK and the Very Long Baseline Array in the USA. The EVN operates an "open-skies" policy - astronomers from around the world obtain observing time via a peer-review process in which resources are allocated purely on the basis of scientific merit. Our main task at JIVE is to operate and develop the EVN Data Processor at JIVE in order to generate and deliver VLBI data, not only to astronomers located here in Europe, but to the international astronomical community at large. We also provide feedback to the telescopes on the performance of their systems and take care that any astronomer who may be unfamiliar with the VLBI technique obtains a comprehensive level of support at all stages of their project. As you have seen this morning, during the e-VLBI launch, the development of new state-of-the-art technologies, software applications and advanced concepts for VLBI is also part-and-parcel of what goes on here.

An important priority for the scientific staff at JIVE is to push the VLBI technique to its technological limit, producing cutting-edge scientific results in astronomy, astrometry and space science. The training of young scientists is particularly important in this regard – in addition to receiving a continuous stream of visiting astronomers from all over the world each year, JIVE is also a partner in various Marie-Curie Early Stage Research and Research Training Networks, and we are busy forging partnerships with the Universities (in the Netherlands and elsewhere). Currently we are involved in the supervision or co-supervision of 4 PhD students in the Netherlands and we hope to double this number before the end of the year. So I want to emphasise in this speech, the strong astronomical motivation that exists within this institute, and I encourage the journalists to approach our staff to talk not only about the new technology associated with e-VLBI, but also about the new astronomy that it enables.

All this does not come for free of course – somebody has to pay! JIVE is established as a foundation under Dutch law and receives funding from several of the major research councils and radio astronomy national facilities in Europe (including the Netherlands Organisation for Scientific Research – NWO; PPARC in the UK; INAF, the National Institute for Astrophysics in Italy; the IGN – the National Geographical Institute in Spain; Onsala Space Observatory in Sweden, and the Max-Planck Institute for Radio Astronomy in Germany. The contribution made by NWO here in the Netherlands is especially important – NWO has played a crucial role in organising the multi-national contributions that JIVE receives each year and in addition, there is the support provided by ASTRON here in Dwingeloo in hosting JIVE. This includes accommodation for both JIVE staff and the EVN data processor, and also services for JIVE without which we simply could not function. We should also not forget the original contributions made by the Dutch and French governments, the European VLBI Network and the European Commission itself, in providing a large part of the original funding that helped to set up and support JIVE, and that also financed the current data processor that we saw in action downstairs earlier this morning.

A crucial element in the success of the EVN and JIVE (and I cannot emphasise this enough) has been the consistent support we have received from the European Commission, especially via the Transnational Access to Research Infrastructures programme. We received our first funding from the EC in 1989 during the era of FP2 and our first Access funding under FP3. The success of the EVN and JIVE in these early framework programmes (including RTD and ICN projects) was instrumental in paving the way for much more ambitious projects such as RadioNet and the other EC-supported projects we see here today.

It is also true that in those early days the concept of a distributed facility (or distributed research infrastructure as we call it today) was unusual to say the least, and that the distributed nature of the EVN was very different from the centralised nature of other big instruments, such as particle accelerators and synchrotron facilities. In the beginning it was hard for people like Richard Schilizzi (JIVE's first director and now director of the SKA International Project) to easily explain the concept of a distributed telescope with multiple and widely separated elements (some located outside of the EU), spanning thousands of kilometres across the planet. To the great credit of the EC and especially the scientific officers of DG-Research, they quickly recognised that for distributed infrastructures like the EVN, the whole was very much greater than the sum of its parts.

The importance of distributed infrastructures and even virtual infrastructures are now firmly established within FP6. Indeed a consortium led by JIVE has recently been awarded up to 3.9 Million Euro from the EC Research Infrastructures "Consolidating Initiatives" programme (managed by DG-INFSO), in order to fully develop the e-VLBI technique as a Grid application based on the connection of the radio telescopes in Europe using the GEANT2 network, operated by DANTE. The consortium includes not only the major radio astronomy institutes in Europe but also several of the leading international research networks, including SURFnet here in the Netherlands. In addition, our aim is to connect telescopes in Australia, China, South Africa, South America and the USA to the data processor here at JIVE. The project is called EXPReS (Express Production Real-time e-VLBI Service) and I can't think of a better way of launching the project, than with the help of Commissioner Potočnik this morning!

I'd like to take this opportunity to tell you something of the character of the institute here at JIVE – in particular the type of people who work here. JIVE currently employs about 25

people of which about half are PhD-level astronomers. With EXPReS and other new projects, we expect to expand to more than 30 people by the end of the year. It's a small but talented group with at least 10 different nationalities being represented. Together with the radio astronomers at ASTRON, we form a critical mass that makes Dwingeloo one of the leading centres in radio astronomy – nationally and internationally.

I am extremely proud of the impact JIVE has achieved not just in radio astronomy but in other scientific applications of VLBI. The role played by JIVE during the recent ESA Huygens project is a good example. JIVE led the project that enabled a global array of radio telescopes to detect the first radio signals from the probe as it descended through the atmosphere of Titan earlier this year and to continue to monitor the probe's signal for many hours after it had landed. The velocity measurements of the Huygens probe and information about its 3-dimensional descent trajectory were processed here at JIVE, and as you will hear later this morning, the level of detail we can see in the probe's motion is astounding, and we hope this is just the beginning of a new collaboration involving the EVN, JIVE & ESA over the coming years.

In wrapping up, I would like to remember how the EVN and ultimately JIVE came into being. Thirty years ago, a group of enthusiastic young astronomers working at the major European radio telescopes in Germany, Italy, the Netherlands, Sweden and the UK, all got together at the Max-Planck Institute for Radio Astronomy in Bonn to discuss a common vision. A few of those astronomers are here today. This vision was to combine together data from all the major radio telescopes in Europe, using the (then) new technique of Very Long Baseline Interferometry (VLBI), forming a single giant, super-telescope of continental and indeed inter-continental proportions. With this first step the European VLBI Network was born, and its membership and capabilities expanded rapidly. In this "bottom-up" process, the collaboration was always natural and never forced, it was, and still is, often based on personal friendships built up over many years, it is this approach that forms the basis of the EVN and many of the other European collaborations that will be presented here today.

The future challenges for Europe with respect to research infrastructures are significant to say the least – European leadership and participation within the global Square Kilometre Array (SKA) and ESO-led Extremely Large Telescope (ELT) projects is essential – the SKA for example, will be an instrument built on a scale that is at least 2 orders of magnitude larger than any previous cm-wave radio telescope; in some senses the development of new (but cost-effective) antenna and data processing technology is only one part of the challenge; the other will be to coordinate and manage the scientific, industrial, commercial, regional and governmental links necessary to develop and exploit a billion-Euro project involving many diverse partners scattered across the globe. There is no doubt in my mind that we in Europe can meet these challenges. I also believe that even in the midst of this huge global effort, small, well-focused and cost-effective institutes with specialised expertise like JIVE can play an important and indeed vital role in realising these ambitions. In particular, it seems to me that it will be essential for us to retain the same spirit of cooperation, clear scientific vision and astronomical motivation that formed the basis of projects like the European VLBI Network over 25 years ago, these qualities must remain at the very root of our ambitions if we are to be truly successful.

Commissioner Potočnik, Minister van der Hoeven, members of the press, ladies and gentlemen a very warm welcome to JIVE!