

Special Interest News:

- Announcement of Annual DITANET Prize
- Recent Publications

Individual Highlights

- Recent Events 2
- Forthcoming Events 3
- New to the Network 4
- Publications & Notice Board 7

Welcome to the First Newsletter of the EU Network DITANET!

Beam diagnostics systems are essential constituents of any particle accelerator; they reveal the properties of a beam and how it behaves in a machine. Without an appropriate set of diagnostic elements, it would simply be impossible to operate any accelerator complex let alone optimise its performance. Beam diagnostics is also a rich field in which a great variety of physical effects are made use of, and consequently provides a wide and solid base for the training of young researchers. Moreover, the principles that are used in any beam monitor or detector enter readily into industrial applications or the medical sector, which guarantees that training of young re-

searchers in this field, is of relevance far beyond the pure field of particle accelerators.

The Marie Curie Initial Training Network DITANET – ‘Diagnostic Techniques for particle Accelerators - a european NETwork’ is the largest-ever EU funded education action for PhD students and young Postdocs in beam instrumentation for accelerators with a project budget of up to 4.16 M€. The network presently consists of 27 partner institutions, including universities, research centres, and private companies. DITANET has now filled most of its position vacancies with first research results becoming visible, and already organ-

ised international meetings and schools. The network aims at strengthening the existing links in the beam diagnostics community and at building up new long-term partnerships.

With this newsletter, the network would ask you to participate in our activities and share with you our enthusiasm for this field. DITANET gives us a unique chance to further improve the performance of our research infrastructures; to push instrumentation beyond the present state of the art, and I am looking forward to exciting times!



Carsten P. Welsch, Coordinator

DITANET Prize 2009

The network announces its first *Prize in Beam Diagnostic Techniques*. It will award a 1,000 € cash prize for an outstanding contribution to the field of beam instru-

mentation for particle accelerators by a researcher in the first five years of his/her professional career.

The deadline for applications is 31st January 2010

and full information on how to apply can be found on the DITANET website:

www.liv.ac.uk/ditanet

Recent Events

First DITANET School on Beam Diagnostics

"The school was excellent ! It is impressive how many different techniques one needs to combine to fully understand a particle beam."

- J.D.

The first DITANET School on Beam Diagnostics took place at Royal Holloway, University of London from 30th March to 3rd April 2009. The School was combined with the first DITANET annual meeting and brought together more than 70 researchers from all over the world.

The School started with an introduction to accelerator physics and the definition of particle beams, before basic beam

instrumentation like beam energy, beam current or transverse beam profile measurement were covered. Later the week more advanced topics, like the monitoring of the machine tune or electron cloud diagnostics, were presented. An excursion to Rutherford Appleton Laboratory including visits to ISIS and DIAMOND on April 1st as well as two tutorials and one poster session complemented the broad program.

A particular highlight was a dedicated industry session on the last day where lecturers from Thermo Fisher Scientific, TMD, Thales, ViALUX, and Instrumentation Technologies gave an insight into cutting edge R&D activities in the industry sector.

Indico Event: 55242



Meeting of the DITANET Steering Committee

The third meeting of the DITANET Steering Committee was hosted by the Cockcroft Institute of Accelerator Science and Technology on 23rd September 2009. The delegates from Germany, Switzerland, Romania, Spain, and the UK criti-

cally reviewed the network's recent activities, such as the first DITANET School on beam diagnostics at RHUL, and planned future schools, topical workshops, secondments, and collaborative research.

The Steering Committee is a body of senior scientists, who were elected at the start of the project, and it is responsible for the implementation of the overall network strategy, making all decisions concerning the network.

Forthcoming Events

First DITANET Topical Workshop, Hirschberg 23rd - 25th November 2009

DITANET'S first topical workshop on 'Low Current, low Energy Beam Diagnostics' will take place in Hirschberg-Großsachsen from 23rd to 25th November 2009.

Low energetic ion beams are very attractive for various high precision atomic and solid state physics experiments. The diagnostics for such beams are a chal-

lenge due to the low energy loss in material and very low currents down to only a few thousand particles per second.

The workshop will allow for exchanging ideas and discussing recent developments. Written proceedings from all contributions will be made available.

Full information on the programme and content can be found on the DITANET web site.

www.liv.ac.uk/ditanet

This event is being jointly organised by GSI (Peter Forck) and HIT (Andreas Peters).

Complementary Skills School, Liverpool 15th - 19th March 2010

The University of Liverpool will host a Complementary Skills School for all DITANET trainees 15th-19th March 2010.

Trainees will arrive in Liverpool on the morning of Monday 15th March with sessions commencing that afternoon. Working days will provide a wide variety

of practical skills including problem solving techniques; scientific writing; intellectual property rights and building the bridge from academia to industry. Departure will be p.m. Friday 17th March.

Participants will find Liverpool an historical and vibrant city, which has re-

cently undergone a dramatic renaissance having been European Capital of Culture in 2008. It has a long musical and sporting history and its waterfront is a UNESCO World Heritage Site.



DITANET Mid-Term Review, Brussels 12th April 2010

The network's mid-term review meeting has been set for Monday 12th April 2010 in Brussels and the venue will be announced shortly. The meeting must be attended by all beneficiaries and trainees; our partners are strongly encouraged to attend.

It is anticipated that the EC will meet with all partners and fellows who will present a scientific overview of work to date, a plan for the remainder of the contract and an outline of all teaching and training activities. Management of the contract, financial and

administrative issues and career plans for researchers will also be covered during the meeting. In addition the fellows will have an opportunity to meet on their own with the EC.



New to the Network

Glenda Wall: DITANET's Project Manager



DITANET has recruited a Project Manager, Mrs. Glenda Wall, who will now be the first point of contact for communication from partners. In addition to the day to day running of the network she will be responsible for the compilation of the newsletter and updates to the DITANET web page; whilst ensuring the project meets all its milestones and deliverables as outlined in the Grant Agreement. Having had previous experience of three European funded projects, for the past three years Glenda has been employed as Project Manager to the Socrates

funded Thematic Network - *HERODOT: European Network for Geography in Higher Education*. This network had more than 200 international higher education institutions as partners and Glenda was responsible for maintaining communication with partners and the European Commission whilst ensuring the project met its outcomes successfully, in line with both institutional and European financial rules. Glenda has wide experience of conference and workshop organisation in addition to the editing of publications, newsletters and web pages.

Glenda is currently registered with the University of Liverpool for an MPhil/PhD. Her research makes a comparison of geography fieldwork in Europe and considers changes in the European Higher Education Area in light of the Bologna Declaration. In addition, she is a Fellow of both the Royal Geographical Society-Institute of British Geographers and the Higher Education Academy.

Welcome !!!

Rahul Singh: Early Stage Researcher GSI, Germany



Rahul graduated from the SGGS Institute of Engineering Nanded, India in 2006 with a bachelor's degree in Electronics and Telecommunication. Following this he made a significant career shift by choosing to study for a master's degree in photonics from the three collaborating universities of Gent University, VUB Brussels and KTH Stockholm through an Erasmus Mundus fellowship, graduating in 2008.

After graduation Rahul worked for over a year as a systems manager for Ericsson in Sweden, on its switching centre platform, until August 2009. At this time Rahul began to explore the many possibilities for a continuing research career, and through this learnt about the DITANET network. Initially, this seemed to be a very distant field, but after a careful study of the various projects within DITANET and considering

the background requirements for the work and future perspectives, he chose to pursue it. Rahul began his PhD on 1st October 2009 at the Technical University Darmstadt and is based at GSI where he is employed to work on the project 'Tune Measurement and Feedback for Heavy Ion Synchrotrons and Storage Rings at FAIR'.

Susanta Das: Experienced Researcher Stockholm University, Sweden

Susanta joined the Manne Siegbahn Laboratory (MSL) at Stockholm University in August 2009 as a Marie-Curie post-doctoral (Experienced Researcher) Fellow within DITANET to work on the beam diagnostics for the Double ElectroStatic Ion Ring ExpERiment (DESIREE) project under the supervision of Anders Källberg.

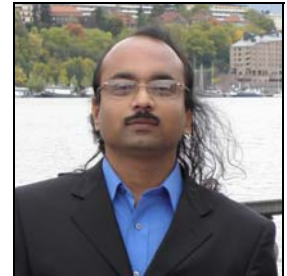
DESIREE will consist of two electrostatic storage rings with a common straight section where merged-beams experiments on positive/negative ion collisions will be performed under

cryogenic and ultra-high vacuum environments. His main responsibilities will be to take part in the development of beam diagnostics for DESIREE, in particular to develop equipment to measure the ion currents and width, and the shape of the two beams that overlap in the merger section for the collision experiments.

Susanta completed his Ph.D. at Western Michigan University, USA in 2009 on the transmission and guiding of electrons through insulating nanocapillaries under Prof. John A. Tanis. In addition, he also studied the inter-

ference phenomenon associated with the emitted electrons in the collisions of fast ions with molecules. Susanta's research interests are, therefore, quite broad from covering nano- and materials science to the fundamental processes in atomic physics.

Having visited many countries to discuss his research, both as a collaborator and an international conference participant, Susanta has worked with researchers and students from a variety of countries.



New Partner: Diamond Detectors Ltd., UK

Diamond Detectors Ltd. is a subsidiary company set up by Element Six to manufacture innovative diamond radiation detectors.

Diamond Detectors Ltd. offers a range of fully packaged diamond radiation detectors and diamond plates as well as custom design services. The initial products developed in association with different Universities cover applications in high energy physics research such as the Large Hadron Collider (LHC) project at CERN, the new Facility for Antiproton and Ion Research (FAIR) at GSI in Germany as well as the Diamond Light Source (UK).

High purity synthetic CVD Diamond presents unique characteristics that make it an excellent material for radiation detection experiments and beam diagnostics applications for both particle accelerators and synchrotrons where position monitoring, volume sensitivity, radiation hardness and/or temperature insensitivity are required.

Diamond can detect any kind of radiation that is more energetic than its bandgap of 5.5 eV, e.g., deep UV photons, X-rays, gamma rays, charged particles and neutrons with a dynamic range in energies spanning from 5.5 eV up to GeV of cosmic rays.

These special characteristics of diamond also allow its use in extreme environmental conditions like high temperature, high radiation, and highly corrosive environments. Hence, its use for example in high energy physics as Beam Condition Monitor and particle tracker at CERN, as a radiotherapy dosimeter, in X-ray synchrotron radiation monitoring (e.g., ESRF, Grenoble, France) or as UV and neutron detector at the Joint European Torus.

The company will actively contribute to the networks Supervisory Board and the training of the DITANET trainees.



New Partner: Uppsala University, Sweden

Uppsala University are engaged in beam instrumentation activities related to the CLIC Test-Facility CTF3, where they have contributed a monitor to measure the beam frequency spectrum at each step of the bunch train combination process in the CTF3 Preliminary Phase which was complemented later with a study of a novel so-called confocal-resonator monitor funded by the Sixth European Framework program (FP6). Also within FP6 they designed the post-collision beam line for CLIC and integrated diagnostics for luminosity and beam losses in it. Furthermore, the Two-beam test-stand in CTF3 with all integrated diagnostic to monitor the two-beam acceleration process were designed and constructed by Uppsala University. The

test-stand is utilized to investigate the power extraction from the drive beam and the effect of discharges on the beam dynamics in order to understand the limitations of the two-beam acceleration process. Linked to these activities they are also investigating discharges on the microscopic level in an electron microscope, a study funded by the Seventh European Framework program.

Uppsala University is also playing a leading role in the development of the optical replica synthesizer (ORS) experiment in FLASH at DESY to measure ultra-short electron bunches by perturbing the bunches with an infrared laser pulse inside an undulator and thereby stimulating them to emit a coherent light pulse, the replica

pulse, with an electric field profile equal to that of the electron bunch. The replica pulse is subsequently led to an optical table housing laser optics diagnostics, among them a commercial device based on 'frequency resolved optical gating' called a GRENOUILLE which reconstructs the electric field profile of the incident light pulse.

Uppsala University are willing to act as a home university for further early stage researchers within the DITANET consortium as indeed they already do in one case.



UPPSALA
UNIVERSITET

News from Thermo Fisher Scientific

Thermo Fisher Scientific introduces the latest addition to their CIDTEC Cameras & Imagers line of radiation hardened cameras, the **ColorRAD** for Color imaging in radiation environments. This high performance CID based, radiation hardened camera, provides sharp, crisp video images in radiation environments with Color imaging up to 3×10^6 rads total dose.

The new ColorRAD product line complements the MegaRAD series of monochrome radiation hardened cameras which operate to

at least 1×10^6 rads total dose. Features of this unique colour radiation hardened camera include; excellent signal-to-noise in high radiation flux rates, anti-blooming performance inherent to CIDs, and wide spectral response. The CID (Charge Injection Device) based radiation hardened cameras operate in total radiation dose exposure over 100 times greater than what conventional CCD cameras can tolerate.

This radiation hardness makes the ColorRAD and

the MegaRAD series of cameras well suited for nuclear medicine, reactor surveillance, vessel inspection, waste monitoring, accelerator experiments, hot cells, safety (ALARA) programs, and other radiation hardened imaging applications common to nuclear power generation, decommissioning, waste disposal, and the high energy physics markets. The new ColorRAD version cameras offer end users unprecedented colours imaging wherever radiation may be present.





Glenda Wall – Project Manager

Cockcroft Institute
4, Keckwick Lane
Warrington, WA4 4AD
United Kingdom

PHONE:
+44 (0) 1925 86 4346

FAX:
+44 (0) 1925 60 3192

E-MAIL:
g.p.wall@liv.ac.uk

Carsten P. Welsch – PI

Cockcroft Institute
4, Keckwick Lane
Warrington, WA4 4AD
United Kingdom

PHONE:
+44 (0) 1925 86 4352

FAX:
+44 (0) 1925 60 3192

E-MAIL:
c.p.welsch@liverpool.ac.uk

www.liv.ac.uk/ditanet

Examples of Recent Publications:

- B. Cheymol, E. Bravin, C. Dutriat, T. Lefèvre, CERN, Geneva, Switzerland, "Design of a New Emittance Meter for LINAC4", Proc. DIPAC Workshop, Basel, Switzerland (2009)
- J. Harasimowicz and C.P. Welsch, "Beam instrumentation for the future ultra-low energy electrostatic storage ring at FLAIR", Hyperfine Interact., DOI 10.1007/s10751-009-0047-0 (2009)
- M. Putignano, K.-U. Kühnel, C.P. Welsch, "Design of a Nozzle-Skimmer System for a Low Perturbation Ionization Beam Profile Monitor", Proc. DIPAC Workshop, Basel, Switzerland (2009)
- M. Putignano, K.-U. Kühnel, C.-D. Schröter, C.P. Welsch, "A fast, low perturbation ionization beam profile monitor based on a gas-jet curtain for the ultra low energy storage ring", Hyperfine Interact., DOI 10.1007/s10751-009-0049-y (2009)
- M. Ripert, A. Peters, HIT, Heidelberg, Germany "Target Materials for a Low Energy Pepper-pot Emittance Device", Proc. DIPAC Workshop, Basel, Switzerland (2009)

NOTICE BOARD

MID TERM REVIEW

We urge all participants to make the necessary flight bookings and arrangements as soon as possible in order to keep costs down and look forward to seeing you in Brussels.

NEXT STEERING GROUP MEETING

Wednesday 13th April 2010, Brussels.

DEADLINE FOR THE NEXT NEWSLETTER

11th January 2010.

About DITANET

The development of novel Diagnostic Techniques for future particle Accelerators is the goal of the European Network (DITANET) which is installed within the Marie Curie ITN scheme. Several major research centers, leading universities, and partners from industry are developing beyond-state-of-the-art diagnostic techniques for future accelerator facilities, whilst jointly training students and young researchers within this unique European structure.

This project is funded by the European Commission as part of the FP7 Marie Curie Actions under contract number PITN-GA-2008-215080.