

## Faces &amp; Places

## ISMD 2013

# An umbrella symposium for the physics of multiparticle dynamics

Record rainfall in Chicago failed to dampen the enthusiasm for multiparticle physics of those attending the XLIII International Symposium on Multiparticle Dynamics, when it took place on 15–20 September at the Illinois Institute of Technology (IIT). While some jokingly credited the umbrellas that were provided to participants for the meeting's success, everyone was excited to attend the first in the series to be held in the US for seven years. With more than 100 participants from nearly 20 countries, ISMD 2013 was organized jointly by the High Energy Physics Division of Argonne National Laboratory and IIT to review progress and discuss upcoming issues in the fields of high-energy physics, nuclear physics and astrophysics.

The ISMD series started more than 40 years ago in Paris, with the goal of establishing a dedicated international conference to discuss multihadron production in quantum chromodynamics (QCD). Early on, the symposium alternated its location between countries in Eastern and Western Europe, which were divided at that time by the Iron Curtain. From the beginning, the goal was to bring experimentalists and theorists together to discuss all aspects of multiparticle dynamics, from new analysis techniques to the latest discoveries.

The tradition continued in September, with



Participants of ISMD 2013 at IIT in Chicago. (Image credit: B Robinson.)

plenary discussions of new results from the LHC experiments at CERN as well as from Fermilab's Tevatron, the HERA collider at DESY, Jefferson Lab, the Relativistic Heavy-Ion Collider at Brookhaven and the BaBar experiment at SLAC. In addition, several talks covered recent progress in theoretical QCD calculations, attempts to model and control the underlying event, searches for exotic processes using boosted jet techniques, multiparticle correlations, diffractive physics and searches beyond the Standard Model using multi-object final states.

A primary theme this year was the striking similarity between proton–proton collisions and heavy-ion collisions. This similarity, which exhibits itself in the high detector occupancy of proton–proton collision events, presents significant challenges for future high-precision physics. A critical question for the next decade will be how to maintain energy resolution and reconstruction with a large contribution from multiple proton–proton interactions (pile-up). Many participants expressed their concern that continued access to low-pT jet physics is essential for the future of the field.

The symposium concluded with two views of the future of multiparticle dynamics. Chip Brock of Michigan State University discussed the conclusions of the Snowmass series of



A colourful contributor to a successful symposium. (Image credit: Z Sullivan.)

planning meetings that took place in the US throughout 2012–2013. James Bjorken of SLAC concluded with a historic perspective on QCD. He considered the connections between outstanding issues that span nuclear physics, high-energy physics and cosmology, and encouraged a broad examination across the subdisciplines for answers.

ISMD 2013 was supported by the US Department of Energy, the National Science Foundation, CERN and DESY, a Research Centre of the Helmholtz Association. The XLIV International Symposium on Multiparticle Dynamics will be held in Bologna in 2014.

● For more information about the presentations and proceedings of ISMD 2013, see <http://atlaswww.hep.anl.gov/ismd13/>.

*The installation of the electron injector for the European XFEL has begun at the project's Bahrenfeld site. Scientists and engineers are currently putting together the different systems of the injector, many of which are tailored to produce 27,000 X-ray flashes per second, a far higher rate than other free-electron laser facilities. The injector will fire electron bunches – needed to produce the X-ray beam – into the accelerating section of the free-electron laser. Here workers guide the injector klystron into place using a crane in the injector hall. DESY is building the injector as part of the German contribution to the European XFEL. (Image credit: European XFEL.)*

