

# THE DUTCH REPORT

Late last year, the American precision engineering community convened close to the 'technology temple' of MIT in Boston, Massachusetts – arguably one of the technological epicenters in the USA. In what is a strong tradition for the ASPE Annual Meeting, the organising committee had again succeeded in selecting an exquisite location at the Westin Boston Waterfront hotel. The Dutch (speaking) delegation has by now become another tradition, and like other years there was again a true sense of precision engineered 'brotherhood'.

DANNIS BROUWER, TON PEIJNENBURG, PIET VAN RENS AND GERRIT VAN DER STRAATEN

## Workshops

Every year, the Annual Meeting of the American Society for Precision Engineering (ASPE) kicks off with tutorials on Sunday and Monday. The 2014 meeting in Boston, on 9-14 November, featured a nice selection of tutorials with significant Dutch contributions: Systems Approach to Thermal Modeling (Ruijl), Design Principles for Precision Mechanisms (Brouwer and Van Rens) and Ultra-High Vacuum Technology (Van der Heijden and Van der Straaten). Attendance was good, and so was feedback.

Closing the second day of tutorials was a keynote address by Dr Mark Johnson, who currently serves as the Director of the Advanced Manufacturing Office in the US Department of Energy under the Office of Energy Efficiency and Renewable Energy. He went into the impact of new manufacturing technologies on creating a fertile innovation environment for advanced manufacturing, enabling vigorous domestic development of new energy-efficient manufacturing processes and materials technologies to reduce the energy intensity and life-cycle energy consumption of manufactured products.

## Technical presentations

A wide variety of topics was covered in the oral presentations at the 29th ASPE Annual Meeting. First was a series of presentations on the design of a new mass standard, by the principle of a Watt balance. The development is driven by NIST (National Institute of Standards and Technology), and creates a significant push in precision equipment development. Controlling a mechanism close to the limits of physical principles pushes equipment design. In the Netherlands, we've gotten used to high-tech companies like Philips and ASML demanding



- 1 Boston by night.
- 2 Impression of the "Design Principles for Precision Mechanisms" tutorial.



such technology push. In this case, such push is created by a US governmental body.

Another remarkable topic in the oral presentations, as well as on some posters, was the Chinese progress in development of advanced lithography tools. In the presentations, this progress was quite explicitly compared to products of the current technology leader in the field – products that many of the Dutch delegation knew quite well. The evidence provided a strong account of progress in Chinese precision engineering for high-end semiconductor equipment. In the poster sessions, Korean progress in development of equipment for display production showed a focus on mechanical bearings and ways to deal with friction to achieve increased positioning accuracy.

Taking a topical perspective, the 2014 conference again emphasised the importance of advanced measurement and control technologies for pushing the performance levels of equipment. In this respect, Van de Ridder (University of Twente) showed a nice concept for active vibration reduction of a Coriolis-type mass flow sensor. More accurate sensors as well as more elaborately designed control concepts are turned to where further optimisation of structures is no longer possible, or no longer economical. To specifically address the mechatronics-related issues with respect to precision, a combined topical meeting is planned on 'precision control' and 'precision mechatronics', to be held in Berkeley or Boston late April 2016.

### After parties

Being an important aspect of the annual meeting, we spent pleasant hours with our international precision engineering friends, over lunch and dinner. The conference dinner was

**3** *The ASPE Annual Meeting featured only one track, so most of the people could meet while attending the same track, creating a strong sense of joint experience, and helping to discuss the topics that were presented. (Photo courtesy of ASPE)*

#### AUTHORS' NOTE

Dannis Brouwer is Associate Professor of Mechanical Automation & Mechatronics at the University of Twente, the Netherlands; Ton Peijnenburg is Manager Advanced Developments at VDL Enabling Technologies Group, Eindhoven, the Netherlands; Piet van Rens is Partner at Settels Savenije van Amelsvoort in Eindhoven; Gerrit van der Straaten is Technology Consultant/Senior Designer at Settels Savenije van Amelsvoort USA in San Francisco.

d.m.brouwer@utwente.nl  
ton.peijnenburg@vdleng.com

in the John F. Kennedy Presidential Library and Museum, which provided an immersive plunge back into the sixties, in addition to a nice variety of culinary specialities.

### ASPE community

At the ASPE society lunch, ASPE introduced the new concept of Technical Leadership Committees. Six distinct fields now have such a committee, managed by a senior member in combination with one of the six directors-at-large of the society. The following are the committees; please note that there is (again) a Dutch director-at-large.

- Precision Manufacturing: John Ziegert (University of North Carolina (UNC)), Alex Sohn (L-3 Communications)
- Metrology Systems: Vivek Badami (Zygo Corporation), Marcin Bauza (Carl Zeiss Industrial Metrology)
- Measurements and Characterization: Chris Evans (UNC), Richard Leach (University of Nottingham)
- Precision Design: Alex Slocum (Massachusetts Institute of Technology (MIT)), Mark Stocker (Cranfield Precision)
- Micro- and Nano-Technologies: Mark Schattenburg (MIT), Craig Forest (Georgia Institute of Technology)
- Controls and Mechatronics: Steve Ludwick (Aerotech), Dannis Brouwer (University of Twente)

### Concluding

With even more than described in this short report, such as a student challenge competition at the conference, and an exhibition with 43 companies, the 2014 ASPE Annual Meeting has proven to be a worthwhile event. ■

#### INFORMATION

[WWW.ASPE.NET](http://WWW.ASPE.NET)