

ASPE's 40th Annual Meeting

Special Opening Session Wednesday Nov 5, 2025 8:00 - 11:45 AM

Perspectives on Determinism and Precision Principles

- **Introduction: Perspective on Determinism and Precision Engineering**

John S. Taylor

University of North Carolina at Charlotte



- **Determinism as a Catalyst for Creative Precision Design (CPD)**

Alexander Slocum

Massachusetts Institute of Technology



- **Instrumentation and Mechanisms: Finding the Ceiling**

Stuart T. Smith

University of North Carolina at Charlotte



- **The Best Recipe for Developing Mechatronic Systems with World-Class Performance**

Jelm Franse

Friedrich Franse Settels Savenije



- **Applying the Principles of Precision Engineering to Enhance the Repeatability of Machine Tools**

Jeffrey W. Roblee

Ametek Precitech



Mark Stocker

Cranfield Precision



- **Determinism in Manufacturing: A Surface Scan Can Reveal a Multitude**

Brigid A. Mullany

University of North Carolina at Charlotte



- **Determinism and Documentary Standards**

Edward P. Morse

University of North Carolina at Charlotte



40th ASPE Annual Meeting Oral Technical Sessions

Technical Session 1 – Precision Design

Session Chairs: Leon Chao, Kumar Arumugam (NIST)

Wednesday Nov 5, 2025 1:45-4:00 PM

- 1. (Session Keynote) Virtual Plan in Kinematic Couplings**
Jan J. de Jong, Floor M. van Ruiten, Dannis M. Brouwer (Precision Engineering University of Twente)
- 2. A Survey of Passive Magnetic Bearings**
Justin M. Verdirame (Physical Precision LLC), Charles Seaberg, Yoonsik Kwon, Kareem S. Nayfeh, David L. Trumper, Samir A. Nayfeh (Massachusetts Institute of Technology)
- 3. Novel Single-Axis Flexure Mechanism With Large Range of Motion and Minimal Bearing Stiffness Drop**
Moeen Radgolchin, Shorya Awtar (University of Michigan)
- 4. Ultraprecision Machine Design for Large Mirror Manufacturing**
Benjamin Bulla (Moore Nanotechnology Systems)
- 5. Ultraprecision Spindle Motorization with Frameless Slotted Motors**
Luis Arturo Aguirre, James Garcia, Barbara Groh, Michael Cullinan (The University of Texas at Austin), Dan Oss, Byron Knapp (Professional Instruments Company)

Technical Session 2 – Micro and Nano Technologies

Session Chairs: Michael Cullinan (The University of Texas at Austin), Robert Panas (Bright Silicon Technologies)

Thursday Nov 6, 2025 8:00-10:15 AM

- 1. (Session Keynote) Comparing State-of-the-Art 2pp to Competing Processes – A Take on Precision, Accuracy and Throughput**
Henrik Akesson, J. Rodriguez, Georg Winkler (UpNano GmbH)
- 2. Solid-State Electrochemical Soft Imprint for Direct Copper Nanopatterning In Optoelectronic Applications**
Atsuki Tsuji, Junji Murata (Ritsumeikan University)
- 3. Precision Prototyping Micromoulds for Microfluidics Using Custom Uv-Led Photolithography**
Mert Gülçür, Greg Gibbons (University of Warwick), Zoe Vo, Xiangyu Gao, James Garcia, Barbara Groh, Luis Arturo Aguirre, Michael Cullinan (The University of Texas at Austin)
- 4. Packaging and Demonstration of the Lightfield Directing Array**
Robert M. Panas, Nora Boettcher, Michael Celebrado, Jonathan Harrington, Arezoo Heydari, Jeff Lang, Ryan H. Lee, Cynthia D.W. Panas, Eric Weflen (Bright Silicon Technologies)
- 5. Closed-Loop Two-Photon Lithography Based on a Single-Cavity Dual-Comb Laser**
Yalan Yu, Zhiwei Zhu, Xinyi Cai, Shih Chi Chen (The Chinese University of Hongkong)

Technical Session 3 – Precision Manufacturing

Session Chairs: Ping Guo (Northwestern University), Christopher Morgan (Moore Nanotechnology Systems)

Thursday Nov 6, 2025 10:45 AM - 2:10 PM

1. **(Session Keynote) IL1200 & IL1600 Series Vertical, Large Scale Ultra-Precision Diamond Turning Machines**
Christian Wenzel (Innolite GmbH)
2. **New Aerostatic Hybrid Bearing Technology for Improved Overload And Tool Collision Safety**
Ralf Dupont (Levicron GmbH)
3. **Optical Meta-grating for Snapshot Multispectral Imaging**
Yaoke Wang, Malachi Landis, PingGuo (Northwestern University), Chi kit Ng (The Chinese University of Hong Kong)
4. **Low Frequency Feed Modulation for Tool Eccentricity Cancellation and Chatter Avoidance in Milling** Sayed Mahmood Shantiaeezade (Oregon State University)
5. **Enhanced Single Point Diamond Rastering** Alex Sohn (Sohn Precision, LLC), Neil Naples (Ametek Precitech Inc.)

Technical Session 4 – Metrology Systems & Characterization

Session Chairs: Brandon D. Chalifoux (University of Arizona), Kevin Elliott (Corning Incorporated)

Thursday Nov 6, 2025 2:15-4:10 PM

1. **(Session Keynote) Deterministic Thinking with a Multi-Wavelength Interferometer**
Paul Köchert, Tobias Meyer, Hongdan Yan, Günther Prellinger, Florian Pollinger (Physikalisch-Technische Bundesanstalt)
2. **Classical Metrology Techniques Applied to a Tabletop Kibble Balance**
Kumar Arumugam, Leon Chao, Stephan Schlamminger, Frank Seifert, Zane Comden, Chandra Shahi, Dave Newell (National Institute of Standards and Technology)
3. **Displacement Interferometry for High-Tilt Applications**
L.A. Cacace, K.Looman, L. Blom, T.A.J.J. van Geel, J.P.M.B. Vermeulen (Eindhoven University of Technology), R. Hendrix (Prodrive Technologies)
4. **Simultaneous Lateral and Axial Displacement Detection Based on Moiré Fringes**
Wei Liu, Gaoyao Zhang, Shih-chi Chen (The Chinese University of Hongkong)
5. **Challenges in Applying Error Budgets to Dynamic Material Testing**
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Technical Session 5 – Controls and Mechatronics

Session Chairs: Burak Sencer (Oregon State University), David Trumper (Massachusetts Institute of Technology)

Friday, November 7, 2025 8:30-10:30 AM

1. **Session Keynote: Decoupling Adaptation of a 3-Dof Dual-Stage Positioning System for High-Precision Optical Inline Metrology**
Daniel Pechgraber, Florian Heumesser, Ernst Csencsics, Georg Schitter (TU Wien)

2. **Spatial Domain Repetitive Control With Application to a Peristaltic Pump**
Michiel Beijen, Kutay Çelik, **ThijsTijman op Smeijers** (Demcon High Tech Systems Enschede B.V.) ,Wouter Hakvoort (University of Twente)
3. **Electromagnetic Active Workpiece Holder for Tool-workpiece Relative Vibration Compensation**
Eun Kyu Kim, Bo Min Kang, Sang Min Lee, Hyeong Min Yoon, Jong Min Sung, Jun Young Yoon (Yonsei University), Ok Hyun Jo, Jangil Lee, Chang Ho Lee (DN Solutions)
4. **Low-order shape control in a Deformable Wafer Table** B. Huisman, M.M.A. Steur, and J.P.M.B. Vermeulen (Eindhoven UT and ASML Netherlands)
5. **An Air Conditioning System for an Ultraprecision Machine to Isolate Room Temperature Variation**
Seung-Kook Ro, Doo-Sun Choi (Korea Institute of Machinery and Materials), Jong-Won Yun (WiPowerOne Inc.), Chul Sook Choi (Inha University), Young-Chan Song (JS Precision Inc.)

Technical Session 6 – Applications

Session Chairs: Eric Buice (Lawrence Berkeley National Laboratory), Jaime Berez (University of North Carolina Charlotte)

Friday Nov 7, 2025 1:45-3:35 PM

1. **(Session Keynote) Establishing Position of Complex Optical Surfaces and Mechanical Features With Micron Accuracy - Day In and Day Out**
Jim Burge, Cormic Merle (Arizona Optical Metrology)
2. **DARPA ZENITH Liquid Mirror Telescope Program – Overview of error**
Sudharsan Kalidoss, Ram Mohan Telikicherla, Zhiyong Wang, Abhishek Patkar, Vikas Chandan, Sreekar Karnati, Xiaopeng Li, Baokai Cheng, Catherine Croson, Ben Walleshauser, Greg Radighieri, Dhanushkodi Durai Mariappan (GE), Denis Brousseau, Gabriel Tayama, Simon Thibault (Université Laval), David Aikens (Savvy Optics Corporation),
3. **Error Budgeting Ultrafast Laser Stress Figuring**
Kevin A. Lavery, Brandon D. Chalifoux (University of Arizona)
4. **Accuracy Enhancement for Optimization-based Structured Light Profilometry**
Stefan Hager, Georg Schitter, Ernst Csencsics (Technische Universität Berlin)
5. **Qualification Setup to Determine Measurement Uncertainty of Beam-Steering Interferometry**
K. Looman, L.A. Cacace, J.P.M.B. Vermeulen, R. Hendrix (Eindhoven University of Technology)