Supply chain management (SCM) problems have become more and more important in the last decade in the semiconductor industry. In the beginning, this was caused by the fact that initial operations (wafer fabrication, probe) are performed in highly industrialized nations, while later operations (assembly, packaging, and test) are carried out in countries where labor rates are cheaper. Today there are also centers of competencies (e.g. bumping) that may consist of only a few process steps that may be done in a different company owned facility or remotely by a subcontractor. These centers of competencies speed up innovations and reduce costs, but increase the complexity of SCM. Furthermore, in the consumer electronics era, the uncertainty in demand and the fluctuation of semiconductor supply chains make the present problem more difficult due to the diversifying product lines of various IC applications and shortening product life cycles.

The semiconductor industry is capital intensive with the cost of an entire wafer fab up to nearly $ 10 billion US. The high cost is primarily due to extremely expensive machines, some up to $ 100 million US each. The manufacturing process is very complex due to reentrant flows in combination with very long cycle times and multiple sources of uncertainty. Capacity expansions are expensive and time-consuming. Solutions that are available for a single wafer fab will not necessarily work for the entire supply chain. Therefore, the semiconductor industry is an extreme field for SCM solutions from an algorithmic and also from a software and information systems point of view.

We are looking for high-quality quantitative research in all areas of SCM in the semiconductor domain. For this special issue, we invite papers that present on all topics related to quantitative methods that will help address the challenges in SCM in the semiconductor domain.

In particular, we seek original contributions on the following topics among others:

- network planning in semiconductor supply chains
- demand planning for the semiconductor domain
- capacity planning and master planning for semiconductor supply chains
- operational planning approaches in the semiconductor domain
- specific approaches for available to promise (ATP) and order management in semiconductor supply chains
- application of supply chain analysis methods including different simulation paradigms to study problems in semiconductor supply chains
- methods to anticipate stochasticity including robust optimization, approximate dynamic programming, and stochastic programming in the semiconductor supply chain context
- techniques to appropriately deal with stochasticity including rolling planning techniques and inventory holding strategies
- modeling approaches for the interactions between different subsystems of a semiconductor supply chain
- role of anticipation of lower level behavior in upper level decision-making in complex semiconductor supply chains
- reference models for semiconductor supply chain planning and control
- (automated) negotiation approaches
- modeling of human agents who interact with the entire system by changing demand signals or priorizations
- description of the interactions between production and development
- supply chain strategy
- role of emerging technologies such as big data, semantic web, ontologies, cloud computing, service-oriented computing, parallel computing on Graphics Processing Units (GPU), augmented reality in semiconductor supply chains
- decision support systems for SCM in the semiconductor domain.

For this special issue of International Journal of Production Research, we will specifically solicit revised and substantially extended versions of papers presented at the Dagstuhl seminar 16062 titled “Modeling and Analysis of Semiconductor Supply Chains”. In addition, we eagerly welcome the submission of high quality, visionary papers not associated with this seminar.

**Important Dates:**
Submission deadline: September 1st, 2016
Completion of first-round reviews: January 1st, 2017
Revised papers due: May 1st, 2017
Target of the second (last) round of reviews: August, 1st, 2017
Target for sending the accepted manuscripts to the publisher: October 1st, 2017

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**Chen-Fu Chien** is a Tsinghua Chair Professor in National Tsing Hua University (NTHU), the Director of NTHU-TSMC Center for Manufacturing Excellence and P.I. for the Semiconductor Technologies Empowerment Partners (STEP) Consortium, Ministry of Science & Technology, Taiwan. He had been the IE Deputy Director at Taiwan Semiconductor Manufacturing Company from 2005 to 2008. He received B.S. degrees in Industrial Engineering and Electrical Engineering with the Phi Tau Phi Honor from NTHU in 1990 and then received M.S. in Industrial Engineering and Ph.D. in Decision Sciences and Operations Research from UW-Madison in 1994 and 1996, respectively. He was a Fulbright Scholar at UC Berkeley from 2002 to 2003 and received Executive Training at Harvard Business School in 2007. His research and development efforts center on decision analysis, modeling and analysis of semiconductor manufacturing, big data analytics, and manufacturing strategy. He received the National Quality Award, Distinguished Research Awards and Tier 1 Principal Investigator (Top 3%) from MOST, Distinguished University-Industry Collaborative Research Award from the Ministry of Education, University Industrial Contribution Awards from the Ministry of Economic Affairs, Distinguished University-Industry Collaborative Research Award from NTHU, Best IE Paper Award and the IE Medal from Chinese Institute of Industrial Engineering, Best Engineering Paper Award and Distinguished Engineering Professor by Chinese Institute of Engineers, and the 2012 Best Paper Award of *IEEE Transactions on Automation Science & Engineering*. He is an Area Editor of *Flexible Services and Manufacturing Journal*, Editor of *Computers & Industrial Engineering*, and an Advisory Board Member of *OR Spectrum*.

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Hans Ehm is Lead Principal Supply Chain of Infineon Technologies AG and their responsible for supply chain innovations. He studied Physics in Germany and is Master of Science in Mechanical Engineering from Oregon State University. In his 30 years of experience in the Semiconductor Industry he was granted managing and consulting Positions at innovation, manufacturing, and for the global Supply Chains. He is acting in several Board Level positions of APICS SCC since many years. He collaborates with Universities and Associations around the globe. Hans is Board member of camLine Holding AG, an IT company providing software for quality. Hans teaches at Universities, supervises Master and PhD students. Hans was part of JESSI (Joint European Submicron Silicon Initiative) in the 90’s and provided in this capacity Know How and Data for MIMAC, a Reference Data Model for simulation in Semiconductor Manufacturing. He is supporting MASM as industry advisor.

John W. Fowler is the Motorola Professor of International Business and Chair of the Supply Chain Management department in the W.P. Carey School of Business at Arizona State University. His research interests include discrete event simulation, deterministic scheduling, multi-criteria decision making, and applied operations research with applications in semiconductor manufacuturing and healthcare. He has published over 110 journal articles and over 100 conference papers. He was the Program Chair for the 2002 and 2008 Industrial Engineering Research Conferences and the 2008 Winter Simulation Conference (WSC). He is currently serving as Editor-in-Chief for IIE Transactions on Healthcare Systems Engineering. He is also an Editor of the Journal of Simulation and Associate Editor of IEEE Transactions on Semiconductor Manufacturing and TOMACS. He is a Fellow of the Institute of Industrial Engineers (IIE) and recently served as the IIE Vice President for Continuing Education, is a former INFORMS Vice President, and currently serves on the WSC Board of Directors.