

[Newsletters](#)

## MANCEF Quarterly Newsletter

Second Quarter 2007, Vol. 5

July 2007

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Nanowise

### President's Message from Clive Davenport

Dear MANCEF member,

MANCEF's premier event for the year, COMS2007 Melbourne, is rapidly approaching. The program has now been posted to the web site at [www.mancef-coms2007.org](http://www.mancef-coms2007.org)

We have been delighted with the response to the call for abstracts and have literally been over-subscribed to the point where we have added further streams to the program. We believe that this will be the most exciting COMS yet.

Whilst the presentations form the basis of the conference, it is the networking surrounding the conference resulting in collaborations and business activity that generates the real power for the participants.

COMS is the meeting place of the global micro and nano technology community. COMS is your conference. The conference has a value proposition for everyone, from research, opportunity realization, technology translation, investment, commercialization and uptake, to economic wealth generation and regional and national development.

This year we are not only looking at all the elements that lead to commercial success but at how small technologies are contributing to address some of the world's most challenging issues such as healthcare, water and energy.

Education and workforce development are the keys to the future. For the first time COMS is opening an entire day to the broader education community by holding a special event that allows teachers, students, media, government and policy people to attend. Coupled with this event will be a hands-on display of some examples of micro and nano technology. Considering that many of the companies that will employ the children of today are yet to be created, we are running a primary school program whereby these children are drawing pictures of how they see their future nanotechnology world. These pictures will be on display as a part of the education day.

Manufacturing and fabrication features this year with two streams -- one addressing the broader issues of manufacturing from silicon to polymers and managing the diversity, the other specifically centered around foundries and their capabilities.

We are also taking the opportunity to highlight some of Australia's successes and pre-eminent facilities, with tours of the world leading Australian Stem Cell Centre, the new Australian Synchrotron, MiniFAB and the Small Technologies Cluster. This is all on top of the many people you will meet at the conference from the country's leading research groups and businesses.

Melbourne, your host city is a modern, warm, vibrant, cultural city where great food and wine complement



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our love of sport, our social activities... and our scientific endeavours.

In preparation for COMS you may wish to practice your G'days -- the classic Australian greeting. You will be given ample opportunity to demonstrate your prowess during your visit.

So many people have said that COMS is about the journey -- we plan to make this the greatest journey ever -- not measured by the distance but by the voyage of discovery -- great new friends, knowledge, business opportunity, ideas and new worlds.

I extend to you, the MANCEF community, the warmest welcome to COMS2007 Melbourne.

Kind regards  
Clive Davenport

#### MANCEF's Mission Statement

MANCEF globally supports the creation, exchange, and dissemination of knowledge vital to people, organizations, and governments interested in the commercialization of miniaturization technologies.



#### COMS2007 Plenary speakers:

**Professor Yoshinobu Baba** -- Department of Applied Chemistry, Graduate School of Engineering, Nagoya University, Microdevice Group Leader, MEXT Innovative Research Center for Preventive Medical Engineering and Professor at the Plasma Nanotechnology Research Center, Nagoya University. Director for Nan biotechnology Research, Health Technology Research Center, National Institute of Advanced Industrial Science and Technology

**Joe Brown** -- Co Founder & Head of Strategic Alliances, SiTime, Sunnyvale, California, USA

**Clive Davenport** -- President MANCEF, CEO Small Technologies Cluster, Managing Director MNT Innovations, Melbourne, Australia

**Dr Kees Eijkel** -- CEO Kennispark, Twente, Enschede, Netherlands, an organization that is responsible for commercialization and related area development which combines the University of Twente Campus and the adjacent Business and Science Park. Kennispark is a joint effort of the Province of Overijssel, the University of Twente and the City of Enschede

**Professor Masayoshi Esashi** -- Director of Micro/Nanomachining Research and Education Center in Tohoku University, Japan

**Dr Erol Harvey** -- CEO, miniFAB (Australia) and Professor of Microtechnology at Swinburne University of Technology in Melbourne, Australia

**Gilbert V. Herrera** - Director, Microsystems Science, Technology, & Components Sandia National Laboratories

**Dr Abid Khan** -- Director, Monash Institute for Nanosciences, Monash University, Melbourne, Australia

**Dr Robert Mehalso** -- Microtech Associates, Strategic Advisor to Academia, Government, and Industry, Rochester, NY, USA

**Dr Steve Walsh** -- Alfred Black Professor of Entrepreneurship and the Co-Director of the Technology Management Center at the University of New Mexico's Anderson School of Management, Albuquerque, NM, USA Professor Robert Warrington - Dean of Engineering and Director of the Institute for Interdisciplinary Studies at Michigan Technological University, Vice President for Education for ASME Nanotechnology Institute, USA

**George Yokoi** - Senior Manager, Olympus Corporation, Japan

## Tours and Facility Visits

There are some excellent opportunities to visit with leading edge companies in Melbourne. Space is limited, and pre-registration is required. Please visit the [registration](#) page to reserve your place ASAP.

[The Micro-Bio-Nano Company](#): MiniFAB offers customized manufacturing and advanced product development, exploiting leading edge polymer microfabrication. Our business is the design, fabrication and integration of polymer microengineered systems

The [Small Technologies Cluster](#): provides a vibrant environment in which to grow your technology business in micro, nano and bio with direct access to state-of-the-art equipment and a highly trained workforce.

[Australian Synchrotron](#): At full capacity, the Australian Synchrotron will be able to accommodate more than 30 beamlines, operating simultaneously and engaging hundreds of scientific and medical researchers, engineers and technologists in the pursuit of scientific discovery and understanding across a broad range of disciplines.

[Australian Stem Cell Centre](#): The Australian Stem Cell Centre is a major Australian collaborative initiative uniting many of the country's leading academic researchers with the biotechnology industry to develop innovative therapeutic products to treat a range of serious injuries and debilitating diseases

## MANCEF News:

### MANCEF has finalized the contract for COMS2008 in Guadalajara, Mexico.

Mark your calendars. August 31- Sept 4th 2008, COMS will be returning to the Americas. We look forward to working with [FUMEC](#) and [COECYTJAL](#) to bring another dynamic region to the COMS fold.

### De Chemie Van Twente

Clive Davenport

I recently visited Kees Eijkel, our past MANCEF President, in his home town in Enschede, Netherlands. Many of us are aware of the international reputation of the achievements of the [University of Twente](#) and the [MESA+ Institute](#). As most already know, Kees is one great ambassador.

We all knew that Kees was heavily committed to a new project associated with the University of Twente. Little did I understand the scale of that project nor his role. I have asked Kees to speak at COMS re his new project -- you will be amazed. It is a great example of the triple helix at work -- universities, industry and governments working together to achieve outstanding outcomes. May I refer you to <http://www.kennispark.nl/kennisparkuk/> for a snapshot of what it is all about.

### Small Times Webcast Micro and Nano Sensors: New Technologies, Opportunities, and Challenges

July 23rd, 2007 at 12:00AM PDT | 3:00PM EDT | 19:00 GMT. MODERATOR: Barbara G. Goode, Editor-in-Chief, [Small Times](#)

MANCEF's treasurer James Wylde of [CSM Analytical](#), and former MANCEF president Roger Grace, of [Roger Grace Associates](#), will be joining Joe Giachino, [WIMS Center](#), University of Michigan for a web cast on micro & nano sensors.

## Overview:

MEMS continue to provide innovative solutions to sensing challenges - and nano technologies are beginning to do the same. Which micro/nano technologies and materials are most important for sensing today? What market forces exist, and what products exist to serve them? We'll discuss key areas where sensor demand is growing - and where small tech solutions are ideal.

The objective of this webcast is to explore important issues and trends in micro and nano sensing technologies, product development, commercialization, and application. A panel of experts will highlight important issues, including:

- Sensors from a functional standpoint
- The buyer's expectations and reality - true-life examples
- Design for success
- Electronics integration
- Where sensors are required and some market drivers
- Why and when MEMS and nano provide good solutions
- Challenges suppliers are facing
- Trends, growth areas, opportunities, and problems to overcome
- Following the panel discussion, the moderator will field questions from the audience.

Please visit <http://www.ian.ibeam.com/events/penn001/23055/> to register.

## Nanotechnology Supplement advertising opportunities

MANCEF members are offered discounted advertising rates on two excellent Nanotechnology supplements. The Times of London produced a 12 page publication in June 2007, and the New York Times will be distributing a 12 page [Nanotechnology Supplement](#) Oct 1, 2007. For more information visit: <http://www.purplegoldmedia.com/mediakit.jpg>

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## Event Wrap up:

MANCEF members share their impressions and insights into MNT events around the world:

### 3rd International Nanotechnology Conference on Communication and Cooperation

Clive Davenport

Kees and I attended [INC3](#) the 3rd International Nanotechnology Conference on Communication and Cooperation in Brussels.

My take-aways included two extensions to Moore's Law -- the scalability of silicon chips, the first known as "More of Moore" which simply stated means the continuing scalability of chips, the second I really liked "More than Moore" relating to a new focus on adding additional functionality on a chip such as RF, power supplies, sensors etc. Whilst this doesn't have wide spread acceptance at present due to potential conflict with standard CMOS processes it is being voiced and once voiced it becomes owned by enthusiasts and gets a life of its own. I believe this augers well for our micro and nano community. Only time will tell and it may be still some time before we see serious traction.

### HannoverMesse

Clive Davenport

My European trip ended at [Hannover Messe](#) and for anyone who has never attended -- consider putting it on your agenda along with [Japan Nano](#) held in February every year. Of course [COMS](#) will always be top of the list.

The Micro and Nano Expo is now held across 2 halls and is not limited to just this space. You will find great examples in the Energy (solar cells, biofuel technology, fuel cells etc) and Precision Engineering halls as well. Neither is it limited to just Germany with exhibitors from around the world.

Many thanks to Uwe Klienkes and his team at [IVAM](#) who hosted our MANCEF activities at the Expo. We were most impressed and their hospitality! A great example of global cooperation. As a result of this exercise we have already a flurry of COMS2007 abstracts and registrations.

A very special thanks to Thomas Debski who looked after and hosted Scott Bryant, MANCEF's Executive Director, during his hospital stay

and recovery following his fall on the cobblestoned pavement in Hannover resulting in a serious broken ankle. A reminder of what can happen on our business travels. Needless to say Scott can now set off a metal detector at five paces with the amount of metal in his ankle. Our best wishes Scott.

## Taiwan Nano2007

Clive Davenport

Rounding off my international activities was attendance at [Taiwan Nano 2007](#) and the [Asia Nano Forum](#) two weeks ago.

These events were held at National Taiwan University (NTU) in Taipei and included a range of activities including an International Nanotechnology Workshop and Business Opportunity Forum, Taiwan Nano Exhibition, Asia Nano Forum (ANF) Teacher's Workshop, National Nanotech Innovation Competition and the Annual Meeting of the National Nanoscience and Nanotechnology Program.

Eric Isaacs, Director of the [Centre for Nanoscale Materials, Argonne National Laboratories](#), gave an outstanding overview of the world's hunger for energy and laid down the challenge as to how we manage that demand. The education program again highlighted the serious interest and activities being undertaken by many countries -- there are some great case studies and examples -- you will hear more of these at [COMS2007](#).

The [Asia Nano Forum](#) is currently comprised of 13 economies in the Asia Pacific region including Australia, China, Hong Kong, India, Indonesia, Korea, Japan, Malaysia, New Zealand, Singapore, Taiwan, Thailand and Vietnam. A general meeting of the ANF was held with attendees from these economies plus the United Arab Emirates. The focus of the ANF is to facilitate open dialog with a view to working together in developing opportunities in the Asia Pacific region.

My thanks to Prof Wu, Drs Song and Su for facilitating Taiwan Nano, their welcome, insights and hospitality.

A meeting of some old friends and many new ones as we expand the MANCEF horizon into Asia Pacific.

## MEC Expo/Nanotech Outreach Workshop

Scott Bryant

Robert Giasolli and Scott Bryant attended the [Nanotech Outreach Workshop](#) in Leuven, Belgium on May 7 and 8, 2007 with about 90 other attendees from around the world. MANCEF was invited to attend the event by Belgium's [IMEC](#) and [RVO Society](#). The focus of the meeting was to examine exhibitory and oratory techniques for explaining, educating, and communicating about nanotechnology and nanoscience to the public.

The entire workshop had useful insights into educational, public outreach activities around the globe with a variety of points of view as to what the intent and value of nanotech outreach is. Sections included Hands-on Museums, Education, Universities, Research Labs, Tech Companies, Media and Government programs. Each session was held consecutively providing a round of repeated dialog and insight expressing the points of view.

For instance we heard from Nick Pidgeon of [Cardiff University](#), Wales, UK who talked about risk perceptions and and risk communication and who mentioned a group of non-informed people that were brought together for the purpose of examining nanotechnology risk (called the NanoJury). It was inferred from this group that no simple analogues or examples are available to create understanding or even adequate perception of nanotechnology.

In another talk Staf Borghs of [IMEC](#) talked about difficulty in changing a cultural perception and gave the example of how we perceive Spinach as have 10X the iron that is really has (Brought to us by Popeye). He also illustrated how fear is stronger when what we fear is something we can not see and when it has a huge potential impact on society.

In summary, broad insights from the event included:

- The world is culturally diverse and it is essential to know the audience before deciding how to communicate the complexity of our technology.
- One exhibit does not work for all countries and all age groups.
- The issue of explaining nano scale and phenomena increase the gap between the teacher and the student. Thus increasing the need to educate both the teacher and student both separately and uniquely.
- The content that was the most successful were those that focused on inspiring the learner/observer as apposed to instilling understanding. Instilling understanding especially of the vastness of the science involved in nanotechnology is unrealistic.
- In addition all outreach should avoid hype -- Nano does not solve everything. In the Media section there was specific examples of how to "touch" people with stories that have a personal edge to them.
- Also continuously indicated was the need to put the experts (academic, government, industry) on the same level as the audience

(communicate with terms that are understood). Governmental speakers clearly communicated their belief that the public needed to understand only in general terms the nature of nanotechnology and its potential value to them. This is to allow the public needed time to observe, self-explore, and consider nanoscale possibilities without a centralized messaging agenda from government. As Andrea Bandelli said "It is not what the message does for the public but what the public does with the message that is important".

- Throughout the conference many speakers addressed the need to open dialog with the public about both the value and the risks of this new technology.
- After many delightful discussions among the presenters and numerous questions from the audience it was clear that there was no best practices established for communicating the risk associated with nano tech. It is an uncharted path, but actually a normal predicament when one considers the conceptual newness and emergent character of the nanoscale.

## OMPAMED/Medical Spring Convention

As a small spin-off of the medical technology supplier's fair [COMPAMED](#), the Spring Convention opened its gates on June 19, 2007 in Dortmund, Germany. The event was organized by [IVAM Microtechnology Network](#) in cooperation with Messe Düsseldorf. More than 100 medical technology experts met in order to discuss mobile applications, materials with new functions and low-priced production solutions, for example for heart valve rings and shape memory alloys. Products that reduce the health care costs set the trend. These are, for example, mini labs with bio sensors, which inform the doctor about the patient's state on the spot. Dr. Doris Schnabel from the Ministry of Innovation, Science, Research and Technology North Rhine-Westphalia (NRW) emphasized the necessity of cooperation between economy and science and the importance of medical technology for the business location NRW. Martin Kusch from ACEOS Seite 2 von 2 GmbH introduced the state-of-the-art of respiratory gas sensors for clinical applications. Next to monitoring the respiration, sensor systems will soon be able to detect diseases in the early stage in the patient's breath. For the next COMPAMED Kusch announced further new products. COMPAMED is the suppliers' fair related to the medical technology fair MEDICA and will take place from November 15 to 17, 2007 in Düsseldorf. Here, IVAM organizes the next meeting for high-tech companies in the areas advanced materials, system integration and production. Only four booths on IVAM's joint pavilion "High-tech for Medical Devices" are still available. You will find further information on [www.ivam.de](http://www.ivam.de).

Submitted by Josefine Zucker, IVAM:

## HARMST 2007

The [HARMST-007 High-Aspect-Ratio Micro-Structure Technology Workshop](#), the premier international event devoted to the advancement of high-aspect-ratio manufacturing technologies and their applications, took place in Besançon France, from June 7th to 9th (<http://harmst-007.femto-st.fr>).

The major institutions having activity in the field of high-aspect-ratio microstructures were represented:

- The research center of Karlsruhe ([FZK](#)), co-organizer of the event
- The microsystem [IMTEK](#) laboratory of Freiburg
- The technical research center of Finland ([VTI](#))
- The technical university of Denmark ([DTU](#))
- The royal institute of technology of Sweden ([KTH](#))
- The Japanese [University of Ritsumeikan](#)
- The University of Louisiana ([LSU](#))
- The Korea Advanced Institute of Science and Technology ([KAIST](#))
- Several research institutes from Korea, Taiwan, Singapour and China, as well as established companies and start-ups.

There were 160 participants from 17 countries. This venue encompassed 37 oral presentations and 111 posters which presented various aspects of the manufacture of ultra-precise micro and nano-structures in materials as diverse as polymers, metals, ceramics and silicon

## Technical Papers

Technical papers covered a broad spectrum of application fields from sensors and actuators to MOEMS and fluidic microsystems and bio-MEMS. In particular the mechanical and optical applications of [HT Micro](#) (Albuquerque, New Mexico), as well as applications in heat exchangers and regenerators in another start-up from Louisiana State University ([Mezzo Technologies](#), Baton Rouge, Louisiana) were welcomed. [VTI](#) (Finland) presented new technological developments at the nanometer scale combining nano-imprint and reactive ion etching to manufacture RF resonators in silicon for the communication domain. Dallas University described an integration process at the chip level integrating a microsystem (here RF inductor) on top of a microelectronic circuit, which enables rapid prototyping and manufacturing of small series for small enterprises. Several groups, from [IMTEK](#) in Freiburg, [FEMTO-ST](#) in Besançon, from Taiwan and

Japan also reported novel technological developments to manufacture needle arrays in silicon or polymers (including biodegradable polymers) for biomedical applications (drug delivery).

Finally, a presentation by the [Royal Institute of Technology of Sweden](#) showed the difficulty associated with dimensional measurements of microstructures with x and y lateral dimensions in the range of a few micrometers and thickness higher than their lateral dimensions by a large ratio. In particular the limitations of several instruments commonly used in metrology are reached and they lead to erroneous results when used in the metrology of high aspect ratio microstructures.

The well-attended Saturday morning session, led by David Tolfree (MANCEF and Technopreneur Ltd) on the commercialization of HARMST-LIGA Processes. He chaired the session and introduced the work of the new International Group that was formed at the MANCEF-COMS2006 conference at St. Petersburg, Florida. The importance of driving commercialisation by linking research groups with companies and industries that want to manufacture precision products was stressed. There still roadblocks such as the lack of design rules and standards in microstructure fabrication processes for components such as masks, resists, materials characterisation etc. The new Group has a web site and it is hoped in the year ahead to bring in more members, particularly from industry and from the new synchrotron facilities.

Members of the HARMST Advisory Board that also includes David Tolfree and members of the MANCEF's Advisory Council, namely Professors Ron Lawes and Volker Saile, met to discuss two bids for future HARMST conferences. The proposal to site HARMST 2009 in Saskatchewan, Canada, presented by Sven Achenbach was accepted. There were two proposals from Asia for the 2011 workshop. Presenters were asked to work together to decide on the best way forward.

David Tolfree stressed the need for future conferences to include a strong commercialisation element and retain the traditional links with MANCEF and its COMS conferences that also held sessions on HARMST- LIGA commercial issues. There was a general agreement that this will be strengthened by the International Group that was recently formed and through having members of both advisory board.

David Tolfree  
VP MANCEF

## Items of interest in the news:

- [Nanoscale Engineering, Hydrogen-Powered Vehicles](#) (Technology News Daily)
- [Nanoscale Electronic Switch](#) (Technology News Daily)
- [Nanotube Formation On Video](#) (Technology News Daily)
- [Report Provides Roadmap for EPA to Address Nanotechnology](#) (Environmental News Bits)
- [New Phenomenon In Physics Discovered On Illumination Of Metal Surfaces](#) (Science Daily)
- [Bright Future For Nano-sized Light Source](#) (Science Daily)
- [Nanotechnology Now Used In Nearly 500 Everyday Products](#) (Science Daily)
- [SPIE Urges R&D Funding](#) (Photonics Spectra)
- [DFG OKs 11 Research Centers](#) (Photonics Spectra)
- [MIT's green nano-factories to produce eco-friendly batteries](#) (Nanotechnology.com)
- [Nanocrystals Key to Better Fuel Cells](#) (Nanotechnology.com)
- [Nanotechnology coming to a brain near you](#) (Nanotechnology.com)
- [Nanoparticles that cancer cells can't resist](#) (nanowerk)
- [New report describes nanotechnologies for environmental remediation](#) (nanowerk)
- [SIA to Co-sponsor NANOTX'07 Conference in Dallas](#)
- [nanoTX'07 to Feature Important Printed Electronics Summit](#)
- [ATDF and UMC to jointly evaluate and commercialize new technologies](#) (Small Times)
- [MEMS Industry Group announced its third annual MEMS Executive Congress.](#)
- [Buckyball Discovery Team Reunion Featured at nanoTX'07](#)
- [NMSU makes a big deal out of tiny technology](#) (New Mexico Business Weekly)

## Publication Opportunities

MANCEF members are invited to contribute articles to MST News. The Editorial Calendar is as follows:

### Trends and Forecasts in MST

Deadline for abstracts: **August 15, 2007**

Deadline for final articles: Nov 15, 2007

Deadline for short news and advertisements: November 16, 2007

Distribution term: December 2007

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The [MANCEF](#) Quarterly newsletter is also interested in publishing articles on MNT commercialization, as well as any information relevant to the MANCEF community. If you would like to contribute, please contact [nwylde@mancef.org](mailto:nwylde@mancef.org)

## Equipment Maker News

### EV Group

- 16 July 2007 [UltraThin Wafer Handling solution introduced by Brewer Science and EV Group \(EVG\)](#)
- 10 July 2007 [EV Group \(EVG\) signs contract with SemiProbe for worldwide distribution of Wafer Probing Systems \](#)
- 26 June 2007 [Customers Rank EV Group \(EVG\) in 10 BEST for 5 years consecutively in the VLSI Research Wafer Processing Equipment Customer Satisfaction Survey.](#)

[Read more from EVG](#)

### Oerlikon

- 21 Jun 2007 [Turnkey solar factories from just one supplier](#)
- 24 Apr 2007 [Oerlikon with double-figure growth in sales and profit](#)
- 19 Apr 2007 [Oerlikon Solar](#)

[Read more news from Oerlikon](#)

### Surface Technology Systems

- 04 July 2007 [STS receives order from prestigious US University.](#)
- 5 July 2007 [TRADING UPDATE](#)
- 21 March 2007 [SUSS and STS Launch MEMS Technology Roadshow](#)

[Read more news from STS](#)

### SÜSS MicroTec

- June 29, 2007 [SUSS MicroTec Ranks First Place Again in VLSI Research 10 BEST Awards for Material Handling Suppliers](#)
- May 11, 2007 [SUSS MicroTec Strengthens Application Support Network](#)
- May 9th, 2007 [SUSS Unveils Next Generation Wafer Bonding Technology](#)

[Read more news from Suss](#)

### Veeco

- Jun 20, 2007 [Cantilever spring constant calibration using laser Doppler vibrometry](#)
- June 15, 2007 [Veeco Introduces Innova\(TM\) Scanning Probe Microscope](#)
- June 12, 2007 [Veeco Co-Sponsors MBE Innovator Award; Nominations Sought](#)

[Read more news from Veeco](#)

## SPONSORED & SUPPORTED EVENTS

Here are some upcoming events that the foundation believes are important. This is not a final list of supported events. Keep an eye on our [Events web page](#) for exact dates, venues, and other information:

<a href="#">SemiCon West</a>	16-20 July, 2007	San Francisco, California
<a href="#">SAME-TEC: Your Professional Development Opportunity For 2007</a>	23-26 July	Dallas, Texas
<a href="#">COMS2007</a>	<b>02-06 September 2007</b>	<b>Melbourne, Australia</b>
<a href="#">NanoTX</a>	02-04 October, 2007	Dallas, TX
<a href="#">MEMS Executive Congress</a>	04-05 November 2007	San Diego County, California

## PUBLICATIONS

### Individual 2nd Edition International Micro-Nano Roadmap Chapters Available

The 2nd edition roadmap is a "living document" that has been 6 years in the making. With the introduction of the hugely successful First Edition in September 2002, the Second Edition builds on what the leadership team learned and our customers told us what they needed to know to succeed in the MST marketplace. We've almost sold out of the 2nd Edition copies, so order yours soon.

While a good value as a complete roadmap, some customers have requested to purchase individual chapters. We have made printed individual chapters are now available for the following chapters. [Order individual chapters here](#) (.pdf):

- [Nanotechnology](#) (explores the nuances of Nanosystems, nano enabled industry segments)
- [MEMS Patents](#) (contains a year by year mapping of Microsystems intellectual property)
- [Process and Equipment for MST](#)
- [Equipment and Tooling for MNT](#)
- [RF MEMS](#) (explores RFMEMS including new opportunities, intellectual property advances, technological process and process advances)
- Two chapter updates are also included: [Foundries](#) and [Packaging & Assembly](#)



The CD-ROM version of the International Micro-Nano Roadmap contains both 1st and 2nd Editions. The 2nd edition CD of the Roadmap has an accompanying printed version.

Members, Partners, and 1st Edition customers receive significant discounts.

We encourage becoming a member of MANCEF in order to receive member price of \$350 for the roadmap. Individual MANCEF membership costs \$150 for two years. The non-member price is \$650 for each copy of the Roadmap.

- Download the [Roadmap order form](#) (.pdf)
- Download the [Individual Membership form](#) (.pdf)
- Download the [Roadmap sales brochure](#) (.pdf)
- Download [2nd Edition Executive Summary](#)

If you would like to see your company news included in the MANCEF quarterly newsletter, please send information to [nwylde@mancef.org](mailto:nwylde@mancef.org) for review.

## CURRENT MANCEF MEMBERS

### Charter Members



[Advanced Jisso Technology](#)

Industrial robot and vision systems



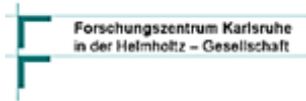
[CSM Analytical](#)

Designs and produces cost efficient, reliable sensing devices



[EV Group \(EVG\)](#)

Wafer processing equipment for R&D applications and fully automated processes



[Forschungszentrum Karlsruhe](#)

Materials, Environment, Health, Energy, and Key Technologies Research and Engineering



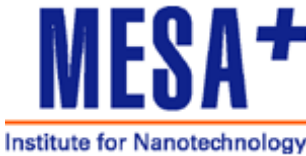
[Glaxo Smith Kline](#)

Research-based pharmaceuticals



[MEMSCAP](#)

Components, modules and systems, IP elements, and design and manufacturing solutions



[MESA+](#)

Nanotechnology, microsystems, materials science and microelectronics training and research



[Micralyne](#)

Micromachining, thin film deposition, and test and assembly capabilities



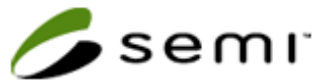
[Oerlikon](#)

Coating, vacuum, precision, and semiconductor technology



[Sandia National Laboratories](#)

Develops science-based technologies that support U.S. national security



[SEMI](#)

Semiconductor, MEMS, and FPD Industry and Standards Information



[Surface Technology Systems](#)

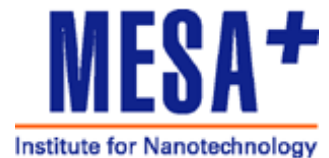
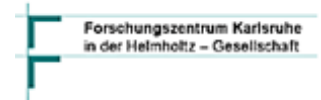
Specialist plasma etch and deposition systems

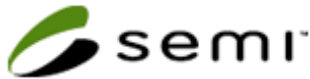


[Süss MicroTec](#)

Mask aligners, bonders, flip chip bonders, spin coaters and probe systems; advanced packaging for semiconductors

## MANCEF MEMBERS





The University of New Mexico



We send brief information on MANCEF activities, events, and developments periodically during each month, usually no more than once a week. The mailing list is password-protected and is only used for one-way announcements from MANCEF. No spam, no discussions. [Sign up for the MANCEF e-information list](#). Messages will arrive from [dbase@mancef.org](mailto:dbase@mancef.org) and simple instructions are encoded at the bottom of each MANCEF message should you desire to unsubscribe from the MANCEF information list.

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