



TIA N-MEMS International Business Work Shop

UMEMSME/MNOIC seminar

Date 10 th of July, 2012

Start 9:00 from Hotel near BigSite, End around 21:00 at the Hotel
NMEMS Innovation building, AIST-East Tsukuba, Ibaraki Japan

Sponsor : Micromachine Center

Sponsor : Research Center for Ubiquitous MEMS and Micro Engineering, AIST

Support : Tsukuba Innovation Arena

Part1 Technical Tour to Tsukuba Innovation Arena (TIA) Research Facility Complex

- 1) 9:00 Bus starts from Hotel (TOKYO BAY ARIAKE WASHINGTON HOTEL)
- 2) 10:30 TIA (Tsukuba Innovation Arena) **AIST Central**
 - + Technology Research Association for Single Wall Carbon Nanotubes, **TASC**
 - + CNT Mass Production Investigating Facility (collaborated with Zeon Corporation)
 - + AIST (The National Institute of Advanced Industrial Science and Technology) in Japan, Tsukuba- Center
- 3) 12:15 To **NMEMS Innovation building, AIST East**
- 4) 12:30 Lunch (Lunch Box and Bottled Tea) at 2F Meeting Room
- 5) 13:30 Technical Tour to TKB812-MNOIC 8/12 inches MEMS Lines at **AIST-east**
- 6) 14:30 Tour End

Part 2 TIA N-MEMS International Business Work Shop/ UMEMSME/MNOIC seminar

At International Seminar Room in **NMEMS Innovation building 1F, AIST East**

Chair Dr. Masao Arakawa Research Center Director, MNOIC

1. 15:00 Welcome Address
 - Dr. Koichi Imanaka General Manager of MNOIC
2. 15:15 Session 1 : Presentation from Guests
 - A) “MEMS foundry production model” (10min)
 - Dr. Peter Merz CEO MEMS Foundry Itzehoe GmbH (Germany)
 - B) “Fraunhofer ISIT MEMS technologies” (10min)
 - Prof. Ralf Dudde MEMS Foundry Itzehoe/ISIT (Germany)
 - C) “IVAM – The international Microtechnology Network” (10min)
 - Mr. Heinz-Peter Hippler Director, IVAM (Germany)

- D) “Canada and Alberta and ACAMP Technology Review” (10min)
 Mr. Ken Brizel CEO ACAMP:Alberta Centre for MNT (Canada)
- E) “Advanced DRIE for MEMS Applications”(10min)
 Dr. Mike Rosa Applied Materials (USA)
- F) “Specialty MEMS product manufacturing”(10min)
 Mr. Vincent Gaff Tronics (France)
3. 16:30 Session 2: Presentation from Japan
- A) “PZT-MEMS with large wafer and their applications” (10min)
 Dr. Takashi Kobayashi, AIST
- B) “Mems ONE: Integrated MEMS design/simulation toolbox”(10min)
 Ms. Nobuyo Fujiwara, Mizuho Information & Research Institute Inc.,
- C) “MEMS foundry in DNP” (10min)
 Mr. Kousuke Suzuki, DNP
4. 17:00 Closing Remarks
 Dr. Toshihiro Ito, Deputy Center Director UMEMSME, AIST Japan
5. 17:10-17:30 Free Time and Demonstration of Mems ONE design/simulation tool at 2F Meeting Room

Part 3 Reception

At the same room of NMEMS Innovation building 1F

- 17:30 Welcome address Dr. Hiroshi Hiroshima Deputy Center Director (UMEMSME, AIST Japan)
- 17:35 Guest Address Mr. Heinz-Peter Hippler Director IVAM
- 19:30 Reception End
- 19:30 Bus to Hotel
- 21:00 Hotel (TOKYO BAY ARIAKE WASHINGTON HOTEL)

Participants

Mr. Ken Brizel	ACAMP (Alberta Centre for MNT)	Canada
Mr. Dan Djukich	Alberta Innovates – Technology Futures	Canada
Mr. Vincent Gaff	Tronics	France
Dr. Peter Merz	MEMS Foundry Itzehoe GmbH	Germany
Prof. Ralf Dudde	MEMS Foundry Itzehoe GmbH/ISIT	Germany
Prof. Harald Schenk	Fraunhofer IPMS	Germany
Dr. Micheal Wagner	Fraunhofer IPMS	Germany
Mr. Michael Schilling	PLAN OPTIC AG	Germany
Mr. Heinz-Peter Hippler	IVAM	Germany
Mr. Arjen Janssens	Solmates Co.	Holland
Mr. Hirokazu Suzuki	Oxford Instruments KK	Japan

Mr. Ken Kushida	Oxford Instruments KK	Japan
Mr. Matteo Martini	Kyodo International Inc.	Japan
Ms. Chie Shinonaga	Alberta Japan Office	Japan
Mr. Norihiro Saito	Alberta Japan Office	Japan
Mr. Daesoo Kim	NTRA(Nano Technology Research Association)	Korea
Dr. Arthur Lin	ITRI South	Taiwan
Dr. Mike Rosa	Applied Materials	USA

Please note that this technical tour and international work shop will be held on 10th of July before the main big event named “Micromachine/nanotech exhibition 2012” held on 11th to 13th of July at Tokyo Big Sight. The picking up and dropping off point by bus is at front of Tokyo Bay Ariake Washington Hotel which is very close to the Tokyo Big Sight.

2. Organizers

- Takashi Mihara (Dr) Director General of MEMS Industry Forum
 - ✧ t_mihara@mmc.or.jp (t.k.s.mihara.f.c.l@docomo.ne.jp) +81-90-1606-2143
- Jun Sakai (Dr) General Manager of MEMS Industry Forum
 - ✧ j_sakai@mmc.or.jp +81-90-4646-7840

Micromachine Center

MBR99 Bldg. 6F., 67 KandaSakumagashi, Chiyoda-ku, Tokyo 101-0026, Japan

TEL : 81-3-5835-1870 FAX : 81-03-5835-1873

<http://www.mmc.or.jp>

3. The picking up point

- Date 10 th of July, 2012
- 8:50-9:00 , the medium size (for 40 person) bus will be waiting on the road in front of the hotel lobby of “TOKYO BAY ARIAKE WASHINGTON HOTEL”
The road between “Ariake Washinton hotel” and “Ariake Central Tower” (Please refer to the map)



<http://washington-hotels.jp/english/ariake/>

TOKYO BAY ARIAKE WASHINGTON HOTEL

3-7-11 Ariake, Koto-ku, Tokyo, Japan 135-0063

Tel : +81 3 5564-0111 / Fax : +81 3 5564-0525



4. Tour Site TIA(Tsukuba innovation arena) :AIST Central

<http://tia-nano.jp/en/index.html>

The Tsukuba area, continually enhanced as a research park since the 1970s, involves core research institutions such as the AIST, NIMS and University of Tsukuba, and has accumulated more than 300 public and private institutions and over 12,000 researchers.

Address;

1-1-1 Umezono, Tsukuba-shi, Ibaraki 305-8556 JAPAN

Tsukuba Innovation Arena Promotion Division, AIST

TEL +81-29-862-6123

This time, we will visit two facilities, one of them is CNT research facilities and 2) another is MEMS facilities. CNT is a famous nano-material, AIST-Japan is one of the leaders in the world from the viewpoint of not only the research activity, but also the mass production toward the industry. We can introduce the outstanding production technologies including super growth method. Please refer to the following web site, <http://tia-nano.jp/en/core/area/carbon-nano.html>



Tsukuba Innovation Arena

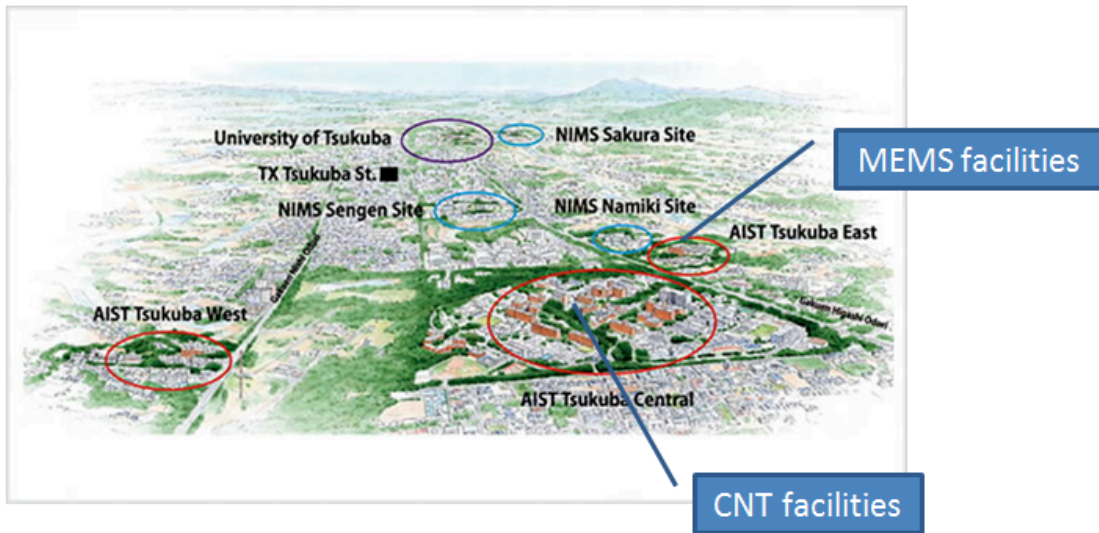


6 Core Research Domains

- Nanoelectronics
- Power Electronics
- N - M E M S
- Nano - Green
- Carbon Nanotubes
- Nano-Material Safety

3 Core Infrastructures

- Nanodevice Research Foundry
- Nanotech Open User Facilities
- Networking School of Nanotechnology



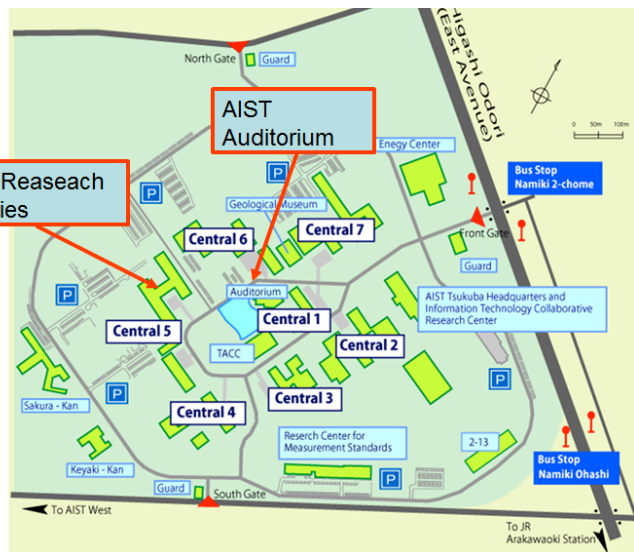
TIA (Tsukuba-Research Complex)



スーパーグロースCNT法実験室と装置



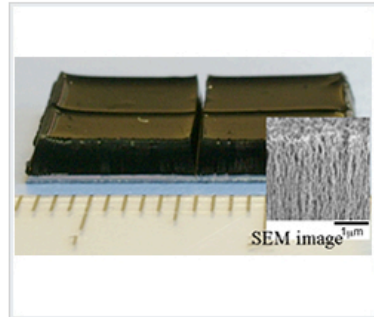
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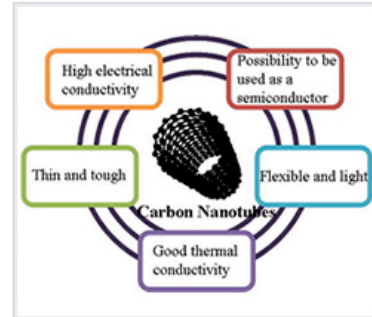
Visit to 1) CNT facilities and 2) AIST Auditorium at AIST Central.

Promoting the development of carbon nanotube application technology

For the practical use of carbon nanotubes (CNT), which are new nanomaterials developed by AIST (Japan), we develop and establish mass production technology in collaborative research with material manufacturers, and verify the results on a pilot plant scale. Also, we accelerate the application of CNT for industry to research and develop the fusion technology of existing product materials and CNT.



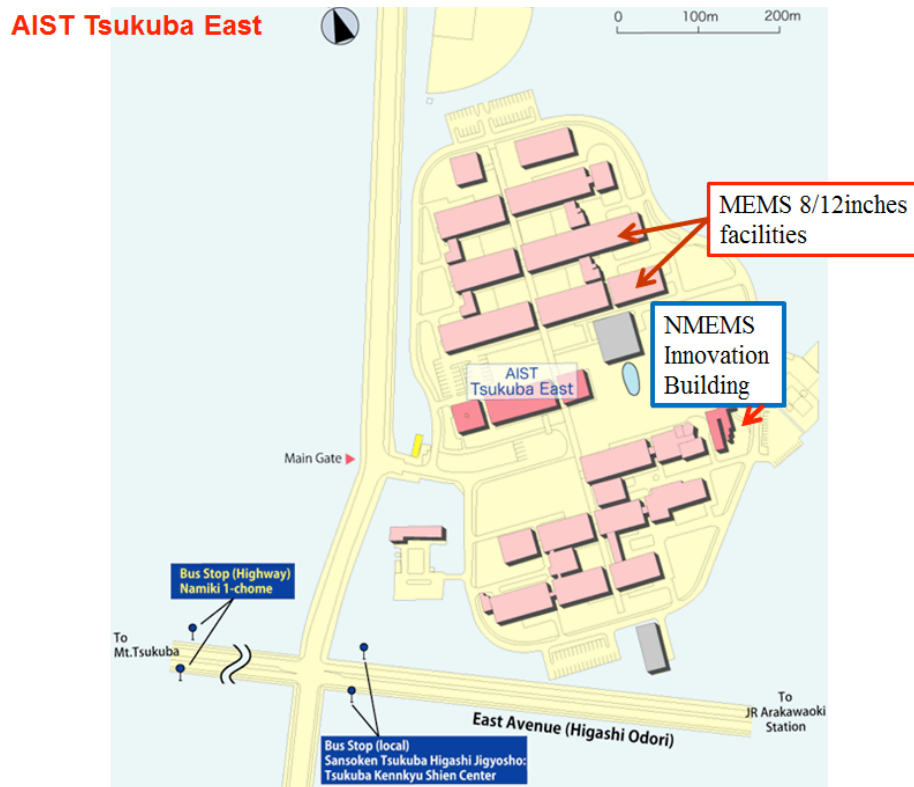
2.5-mm-tall single-walled carbon nanotube forests synthesized by mass production technology developed by AIST(super-growth method)



Features of carbon nanotubes

The introduction of CNT technologies

5. Another tour site and the place of work shop :NMEMS Innovation building at AIST east



Map of AIST east: After the technical tour of AIST-Central, our bus goes to NMEMS innovation building in AIST east for lunch. In the afternoon, we will introduce MEMS 8/12 inches facilities first and then, the work shop will be held later in NMEMS Innovation building

Address of AIST-East;

1-2-1 Namiki, Tsukuba-shi, Ibaraki 305-8564 JAPAN

As N-MEMS core research facility, we have following two organizations at AIST East

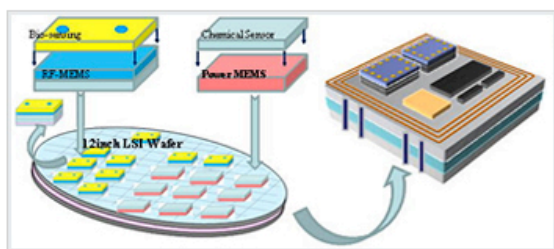
[1] **Research Center for Ubiquitous MEMS and Micro Engineering**

<http://unit.aist.go.jp/umemsme/cie/>

The **Research Center for Ubiquitous MEMS and Micro Engineering** aims at making contributions in realization of a green, safe and secure society through the R&D on manufacturing and application technologies of *MEMS* (Micro ElectroMechanical Systems).

N-Formulation of a center for manufacturing technology development of N-MEMS, and support for development and practical application of devices

Reinforcing the existing MEMS pilot production line at AIST Tsukuba East, we have formulated a pilot foundry to meet high social needs for integrated N-MEMS (diameter: 200-300 mm). In cooperation with relevant universities and industries, we aim to improve the environment as a center where a range of collaborative research and green MEMS studies and verification can be conducted.



Three-dimensional heterogeneous integration N-MEMS



Introduction of N-MEMS research facility

[2] **MNOIC(MicroNano Open Innovation Center)**

MNOIC(MicroNano Open Innovation Center) offers the technical support for research and development of MEMS, Metal Mold and Wafer/Chip MEMS packaging utilizing a worldwide-level state-of-the-art 8 and 12 inches MEMS facility. MNOIC is established in 2011, as a part of an activity of MIF (MEMS Industrial Forum), Micromachine Center. Collaborating with UMEMSME(Research Center for Ubiquitous MEMS and Micro Engineering) in AIST (The National Institute of Advanced Industrial Science and Technology) JAPAN, and Utilizing the 8/12 inches MEMS facility at TIA [TKB812]. MNOIC offers the engineering expertise and skills to support industrial development.



NMEMS innovation building.



The front of the building.



The room of research office.