MANA

International Center for Materials Nanoarchitectonics

FEATURE:

Advanced *nano-fabrication* technology catalyzing discovery and innovation at WPI-MANA

Toshihide Nabatame, Namiki Foundry Manager

RESEARCH HIGHLIGHTS:

- PHOTONIC CIRCUITS HOSTING ELECTROMAGNETIC WAVES WITH PSEUDOSPIN
- ORIGINS OF MACROSCOPIC FRICTION LINKED TO ENERGY LANDSCAPE ON THE NANOSCALE
- POROUS STRUCTURE OF A LAYERED SILICATE WITH SELECTIVE ADSORPTION PROPERTIES REVEALED

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“Our role is to work with scient supporting their research on d

Facilities for lithography and nanofabrication were established at NIMS in 2004 under the leadership of Masakazu Aono, the Director the International Center for Materials Nanoarchitectonics (WPI-MANA) at NIMS from 2007 to 2017. The facilities became a part of WPI-MANA in 2009 and are now referred to as the Namiki Foundry.

“Researchers at NIMS and WPI-MANA are experts in materials science but few have experience of lithography and device fabrication,” says Toshihide Nabatame, Manager of the Namiki Foundry (Former MANA Foundry). “So our role is to work with scientists in supporting their research on device fabrication.”

The Namiki Foundry has eight cleanroom areas in its 235m² floor space. The areas are drawing and photo lithography; wet process; etching; film deposition; nano measurement; nano analysis; heat treatment and dicing and wiring (Fig.1).

The Namiki Foundry staff prepare samples suitable various type of characterization, for example, production of devices, using electron beam lithography to investigate properties of nanowires and nanosheets. Notably, they handle any kind of material including organic, inorganic, metals, insulators, magnetic, superconductors and composites.

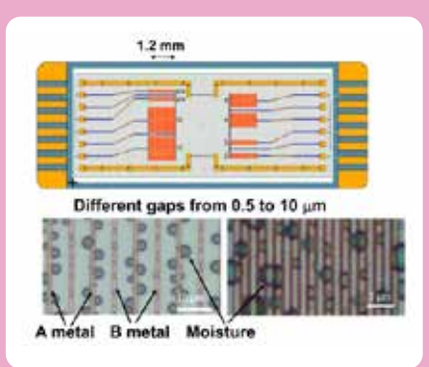
Effective communication in a bilingual environment

WPI-MANA is an international research organization with researchers from all over the world and the Namiki Foundry includes bilingual staff to work with researchers from overseas on their projects. “Our bilingual staff have TOEIC scores of more than 900 and provide consultation, training and all the necesarry operations in Namiki Foundry all in English,” explains Nabatame. “Also Namiki Foundry staff room is located adjacent to the clean rooms and are available all day until 19:30 to handle enquiries and conduct experiments.” (Fig.2) The annual fees for using the facilities are 50,000 JPY for NIMS/WPI-MANA researchers and 100,000 JPY for guests and trainees.

The Namiki Foundry has played a critical role in the wide ranging successful research conducted at WPI-MANA. “Our success is based on effective communication with the research staff at WPI-MANA,” says Nabatame. “We continue to welcome requests for consultation about research, tours of the facilities, and especially ‘nomikai (drink party)’!” ■

Examples of projects undertaken at the Namiki Foundry

● **Moisture sensor with interdigital electrodes**



JIN KAWAKITA, TOYOHIRO CHIKYOW. DETECTION OF MICRO/NANO DROPLET BY GALVANIC-COUPLED ARRAYS. ECS TRANSACTIONS. 75 (29) (2017) 51-59 10.1149/07529.0051ECST

Fig.1

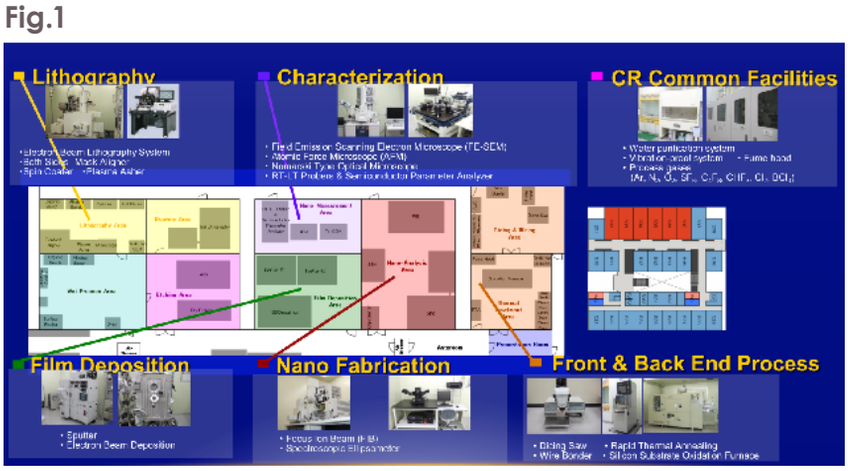


Fig.2

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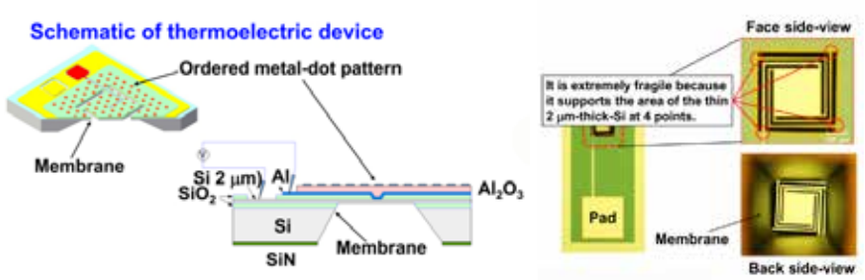
device fablication.”

Toshihide Nabatame
Namiki Foundry Manager

RESEARCH HIGHLIGHTS

● **Thermoelectric device with membrane structure for IR sensor**



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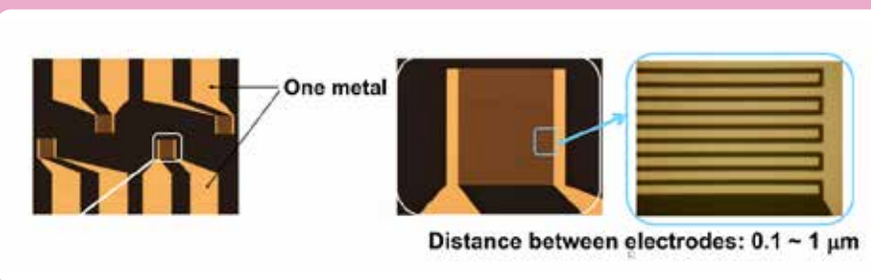
● **Interdigital electrodes fabrication process for membrane stress sensor (MSS)**



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