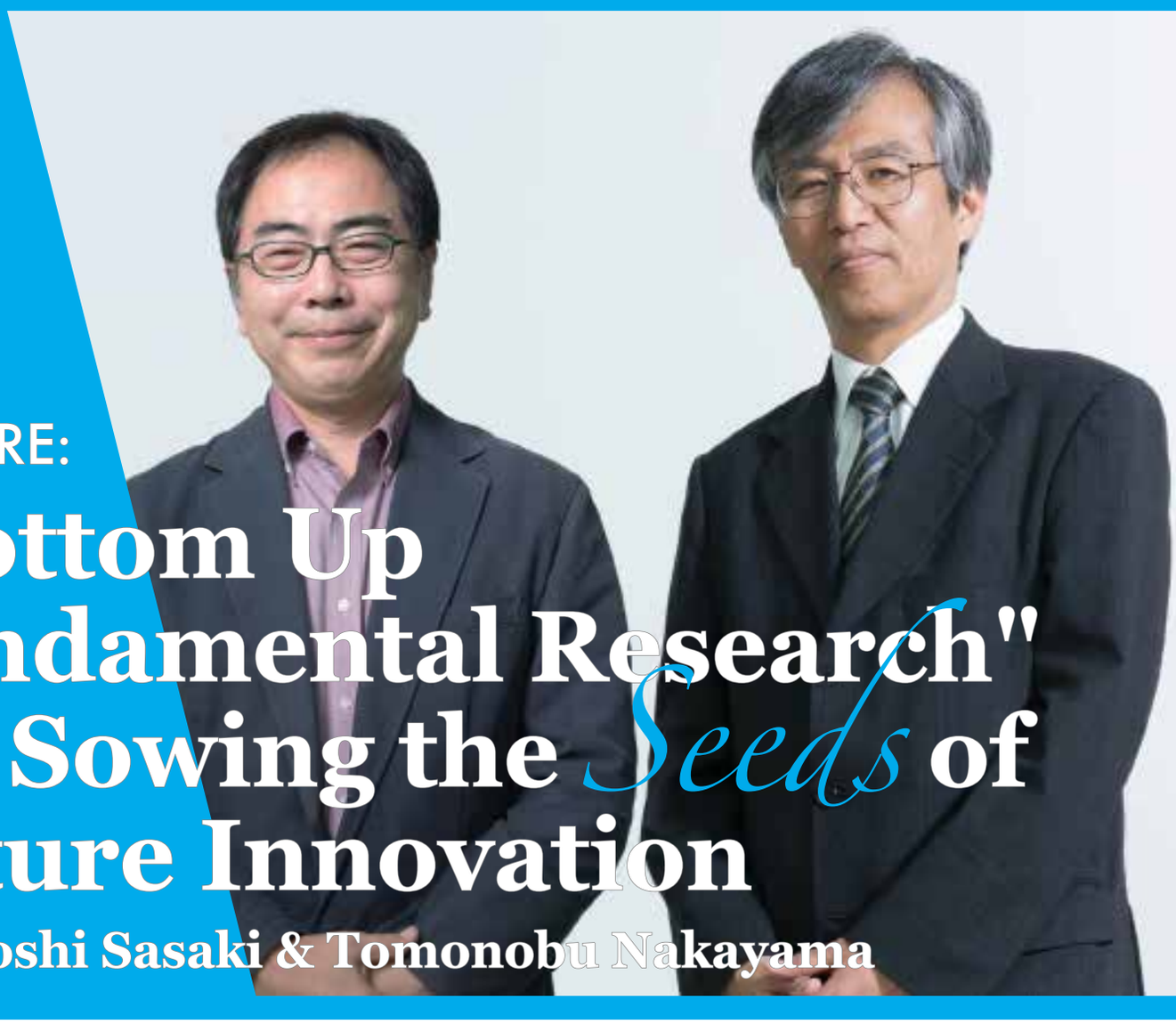
MANA

International Center for Materials Nanoarchitectonics



FEATURE:

"Bottom Up Fundamental Research" for Sowing the *Seeds* of Future Innovation

Takayoshi Sasaki & Tomonobu Nakayama

RESEARCH HIGHLIGHTS:

- DRIVING SOFT MOLECULAR VEHICLES ON A METALLIC SURFACE
- INNOVATIVE TRANSISTORS BASED ON MAGNETICALLY INDUCED MOVEMENT OF IONS
- ATOMICALLY THIN PEROVSKITES BOOST FOR FUTURE ELECTRONICS

e-Bulletin Vol. 01
December 2017

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The International Center for Materials Nanoarchitectonics (WPI-MANA), Tsukuba, Japan, was launched as part of the 10 year World Premier International Research Center Initiative (WPI) program (October 2007–March 2017) funded by Japan’s Ministry of Education, Culture, Sports, Science and Technology (MEXT). Now, ten years on, WPI-MANA is internationally recognized as one of the world’s leading research institutes focusing on creating innovative functional materials based on in-depth knowledge of the interaction and structure of individual nanoscale components.

Melting pot of excellence in science and innovation

“I was appointed Director of WPI-MANA in April 2017 and am working with Deputy Director Tomonobu Nakayama and staff at WPI-MANA to expand our research based on our achievements over the last ten years that include MSS, neuromorphic networks, metamaterials, and atomic switches acting as artificial synapses,” explains Takayoshi Sasaki. “Research at WPI-MANA is international, multidisciplinary, and dynamic. This reflects the diverse nature of our ideas and global reach of our scientists, approximately 45% of whom are from overseas and 16% are female. WPI-MANA is a ‘melting pot’ of highly motivated scientists.”

Research organization at WPI-MANA

WPI-MANA is one of seven research centers at the National Institute for Materials Science (NIMS) in Tsukuba with the mission of “bottom up fundamental research”. The research is carried out by 228 scientists, covering three major areas of ‘nano-materials’, ‘nano-systems’, and ‘nano-theory’. The activities at WPI-MANA’s Tsukuba research center are complemented by five satellite centers at Georgia Tech and UCLA, USA; University of Montreal, Canada; CNRS, France; and University College London, UK.

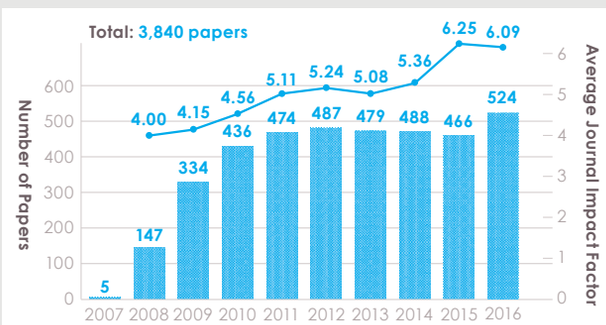
Major achievements: Scientific publications and intellectual property

WPI-MANA’s international status as a scientific powerhouse is based on its tremendous research output during the WPI program. Specifically, a statistical overview shows that scientists at WPI-MANA published 4,219 papers with an average impact factor of 6.09 in 2016, and approximately 49% of the papers were co-authored with international collaborators with a peak of approx. 57% in 2016.

Furthermore, as of January 2017, nearly 4% of these publications were in the top 1% of highly cited papers, that is, 142 out of 3,840. In terms of the field weighted citation impact (FWCI), the FWCI of WPI-MANA is 2.38. This means that WPI-MANA papers were cited 138% more often compared to the world average of FWCI=1.

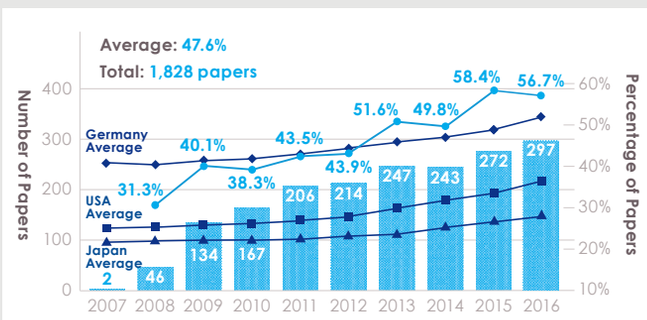
Innovative research at WPI-MANA

Number of Papers and the Average Impact Factor



MANA Affiliated Research Papers (Oct 2007 – Dec 2016)

Internationally Co-Authored Papers



Internationally co-authored papers from MANA (Oct 2007 – Dec 2016)

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amic.”

Takayoshi Sasaki
MANA Director

Tomonobu Nakayama
MANA Deputy Director

has also yielded patents and intellectual property. Specifically, between October 2007 and December 2016, WPI-MANA registered 642 patents (489 in Japan and 153 overseas) and applied for 823 patents (578 in Japan and 245 overseas).

Deeper exploration of Nanoarchitectonics and artificial perception

“Our plans for the next decade are based on building on the scientific legacy of the last ten years,” says Sasaki. “Globally, in addition to our five satellites centers we will also work closely with more than 200 collaborators overseas with whom we have 60 MOUs. In terms of research themes, we will increase efforts on studying larger and more complex hierarchiral organization of nanomaterials, nanocomponents, and advanced nanoanalysis technology.”

In addition, WPI-MANA is formulating plans to strengthen links with academia to enable even more young researchers, post-docs and principal investigators (PIs) to join the institute. Outreach and international networking events are also high on the agenda. “We are organizing an international symposium on ‘artificial perception’ in March 2018,” says Nakayama. “This symposium will be an excellent opportunity for scientists at WPI-MANA to share their plans for the future with the larger international nanoscience community.”

Sasaki has a clear vision for the future of WPI-MANA. “Our institute has excellent facilities, highly motivated scientists, and administration staff,” he says. “We welcome scientists from all over the world to join us, including graduates for our well funded post-doctoral positions.” ■

WPI-MANA Website
- **http://nims.go.jp/mana/**

MANA International Symposium 2018 - Toward Perceptive Nanomaterials, Devices, and Systems -
- **March 5 - March 7, 2018**
- **International Congress Center "Epochal Tsukuba", Tsukuba, Japan**
- **http://www.nims.go.jp/mana/2018/**

RESEARCH HIGHLIGHTS

Please visit our e-Bulletin website for details!
More articles and Research Highlights are available.

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