nABACUS Partners

µicro *Space*

Asia Effort in Micro/Nano Satellite R & D and Opportunities for Int`l Collaborations

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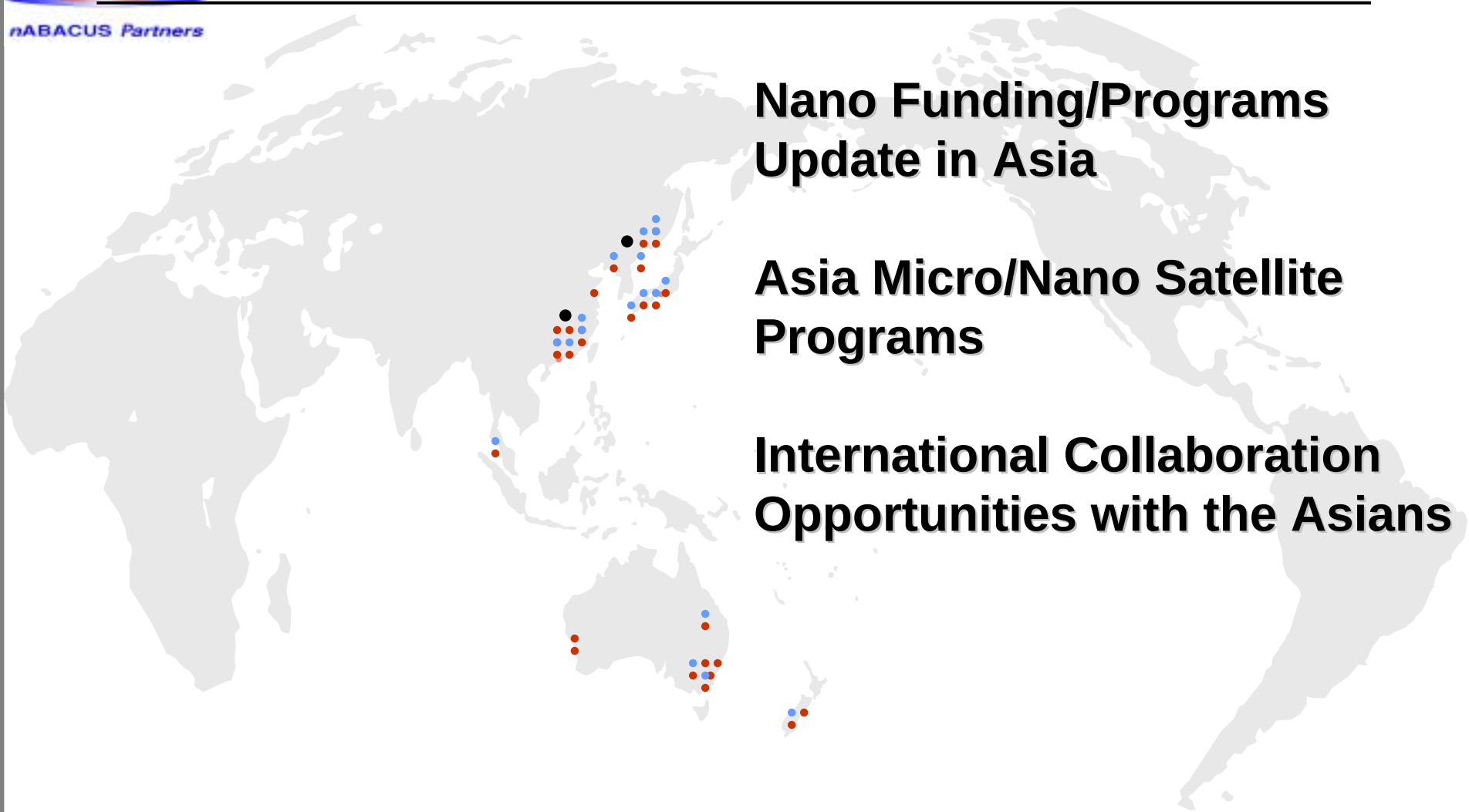
Outline



Nano Funding/Programs Update in Asia

Asia Micro/Nano Satellite Programs

International Collaboration Opportunities with the Asians

Company Business Scope and Services

Micro/Nano Systems for Aerospace R & D

Project Management

Industry and Market Analysis Providing comprehensive reports and briefings on government policy, corporate strategy, R & D and market survey on emerging technologies including Biotech, Nanotech and Information Technology.

Liaison Providing timely local logistic support and staff-on- demand.

Promotional Activities Organizing Conferences, Seminars, and Exhibitions in Asia Pacific region providing the latest technical and market information with networking platforms in Nanotech, Biotech and other emerging technologies.

Sales and Marketing of Hightech Components, Equipment and Systems

Technology Transfer with On-site Training, Implementation, Deployment, and Documentation Capability

Introduction

- Strong Push in commercialization on MEMS and Nano Technology in Asia including China, India, Japan, Korea, Taiwan, and others.
- Nanotechnology is the buzzword in Asia S & T policy making
- Applications of Micro/Nanotech in Space Technology including small satellite technologies are being planned.
- For details read: Asia Pacific Nanotech Weekly www.nanoworld.jp/apnw

Peoples Republic of China – Nanomaterials

National Nanotechnology Initiative

$300m government allocated for Nanotechnology over 5 years

New Initiative has been approved with additional budget of USD100/Y

National Nanotechnology Center

TsingHua University- Micro/Nano Satellite Program is preliminary. Just started the conceptual stage

Beijing Univ- MEMS Fab- aiming at becoming a MEMS foundry. Good for Space Application of MEMS producing small quantity of components.

Japan – Early Government and Industry Involvement and Mature Technology Infrastructures

Nanotechnology Initiative

Public investment into Nanotechnology started 15 years ago (JST`s ERATO, MITI)

600,00m yen government spending in 2001
790,00m yen government spending in 2002
1000,00m yen committed for 2003

USD20million MEMS commercialization program starting 2003
Over 11 foundries
METI. NASDA and MEXT are all currently planning R & D program focusing on MEMS/Nanotech for Space Technology including Micro/Nano Satellites.
Launched MicroLabSat –50kg, spin-type small satellite

Korea Similar to US NNI, Strong Nanoelectronics and Bionano initiatives

10 Year Nanotechnology Plan (2.4T Won, 11% on Bionano, 19% on Industrialization)

- NT Master Plan (2001.7)
- '02 Action Plan for NT development(2002.3
- NT Development Promotion Act (Dec. 2002)

$70m government spending in 2001
$185m government spending in 2002
$200m for 2003

KAISAT 1 to 3 launches, one to be launched this year
Funding Source- MOST, USD 8 million (1998-2002)
Strong interest in cooperation with Europe
MEMS and Nanotech are in national priority

Singapore

Nanotechnology Initiative –strengthening R & D

$30m government spending in 1997-2001
$25 – 30 m/3Y government spending from 2003-2005

Agency for Science, Technology and Research (A*STAR)

Economic Development Board (EDB) showed interest in Small Sat.

NTU- microsatellite program for Earth observation due to launch in 2004, interest In demonstration of MEMS technology for the next mission.

Malaysia

Nanotech has entered the government policy making.

Total budget for the Malaysia 8th Year Plan on Nanotech is about USD 20 million

One microsatellite launched in year 2000, TiungSat-1, 50kg mass.

Current very ambitious program for Earth observation in the Equatorial belt area composed by a constellation of 8 microsatellites

Nanosatellite program started

Taiwan

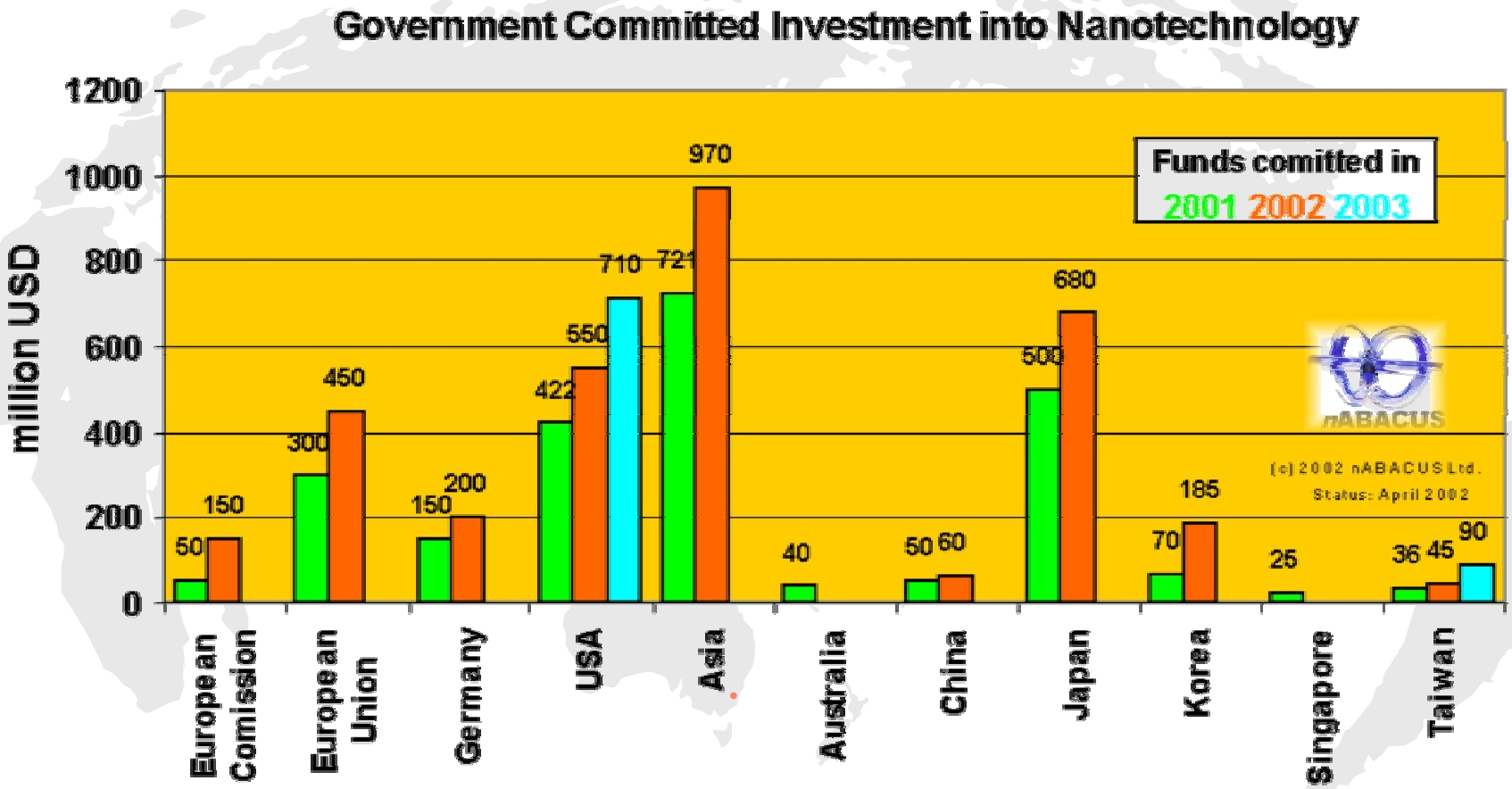
Nanotechnology Initiative

Science & Technology Key Areas Over 5 years (started 2003)

- **Nanotechnology (NNI) US$600m**
- **Semiconductor Electronics**
- **Genomics and Proteomics**

TsingHua University, Good microelectronic and MEMS facility, very interested in matching funding for R&D.
ROCSAT-3/COSMIC - a constellation of 6 micro-satellite to be launched in 2005

Nanotechnology Programs in Asia Pacific



Recommendation

Access to Information

Assessment the advantages of Asia-EU collaborations to enhance EU space technology Programs

Establish Asia Micro/Nano Satellite Network

Develop Strategy for EU-Asia government and industry Collaboration

Start feasibility project between EU- Asia and road-mapping