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# EC-GEPRO

**Partner: SU**

**Shanghai University (SU)  
Shanghai, P.R.China**

- 
- **Introduction of SU**
  - **Introduction of SMIT Center**
  - **The work report for tasks of which SU is task leader**
  - **Plan for the further work**

# Introduction of Shanghai University



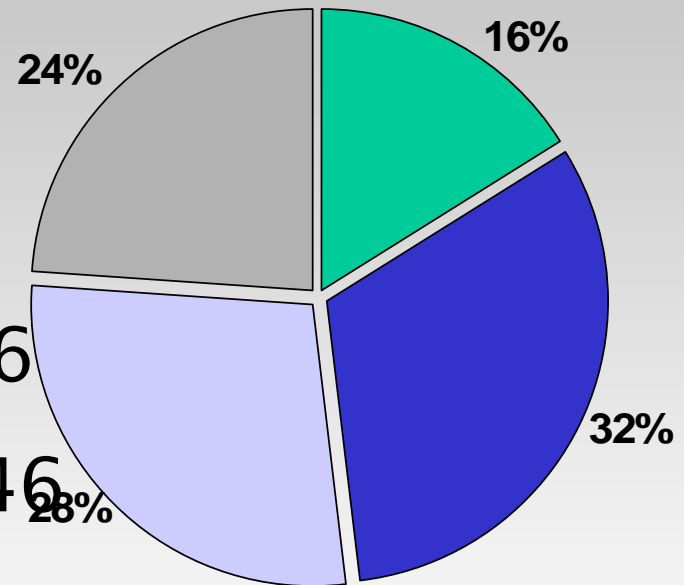
- Founded in 1994, by consolidating four former institutions of higher learning;
- In recent years, it stands in the first 30 domestic universities of China, in its research funds, number of award-winning achievements and scientific papers.

# Introduction of Shanghai University

**Faculty:** more than 2500

## Offering:

- Undergraduate program: 60
- Postgraduate program: 146
- Doctoral program: 35



■ Professor

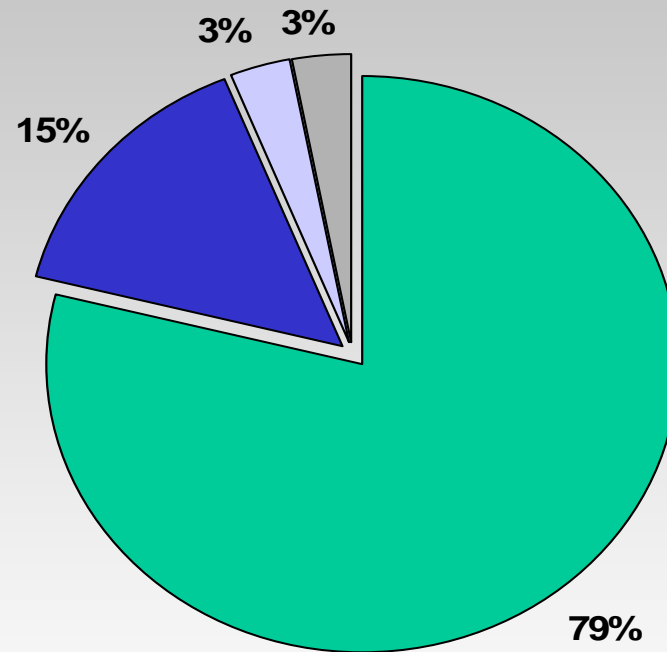
■ Associate Professor

■ Lecturer

■ Other Staff

# Introduction of Shanghai University

Full time student: more than 33000



Undergraduate  
PhD Candidate

Master Candidate  
Foreign Student

# Introduction of Shanghai University

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22 colleges cover following major disciplines:

- **Mathematics, Dynamics & Hydromechanics;**
- **Material Science;**
- **Physics (Solid Physics, Radio Physics);**
- **Computer & Information Science;**
- **Biology;**
- **Metallurgic Engineering;**
- **Mechanical Engineering;**
- **Electrical and Automatic Control Engineering;**
- **Electronics & Communication Engineering;**
- **Instrumentation Science & Technology;**
- **Environmental Engineering;**
- **Business Administration;**
- **Sociology;**
- **Chinese Literature;**
- **Art.**

# Introduction of SMIT Center

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## Overview

**Established** by CTU, Sweden and SU, China, in October 2003, financially supported primarily by Shanghai and Gothenburg city government, as well as membership companies.

**Vision:** To bring the microsystem integration industry in China and Sweden into the world class.

### **Missions:**

- To conduct application driven research activities to serve the need of microsystem integration technology industry.
- To educate master and PhD students through joint effort and research programs.
- To create a channel to enhance technical and economic exchange between China and Sweden.

# Introduction of SMIT Center

## Equipments



**Thermal shock testing chamber    TEMPERATURE & HUMIDITY    Mechanical tensile testing**  
**TESTER    CHAMBER**

# Introduction of SMIT Center



LCF micro tester model 228-A



Olympus UH3 Ultrasonic Microscope



Ultraprint 2000 Screen Printer

# Introduction of SMIT Center



# Introduction of SMIT Center

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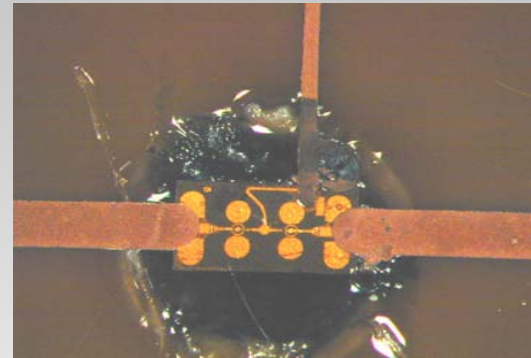
## Research and Technology Service Field:

- Packaging Materials
- Advance Packaging Technology
- Reliability in Electronic Packaging

# Introduction of SMIT Center

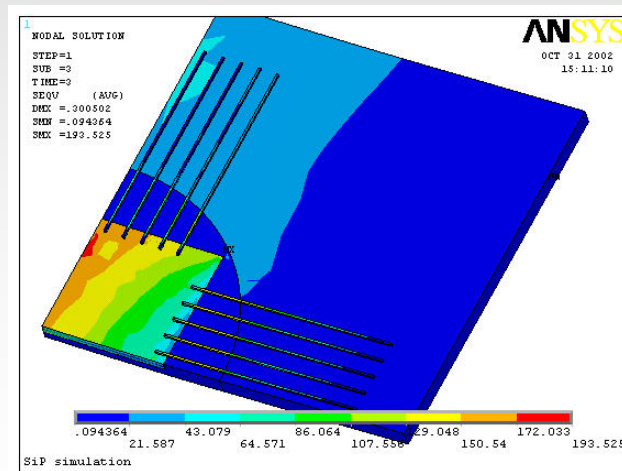
## System integration on low-cost substrate

Low-cost LCP substrate



Reliability testing

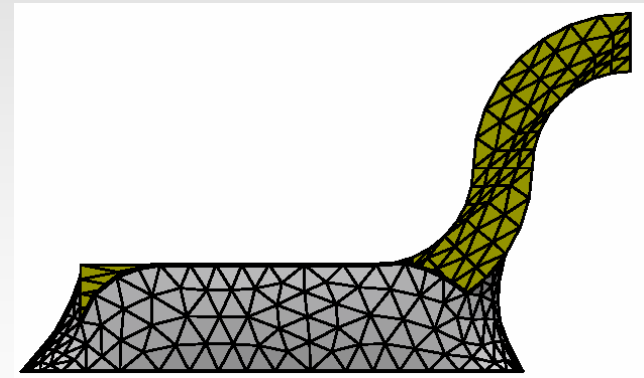
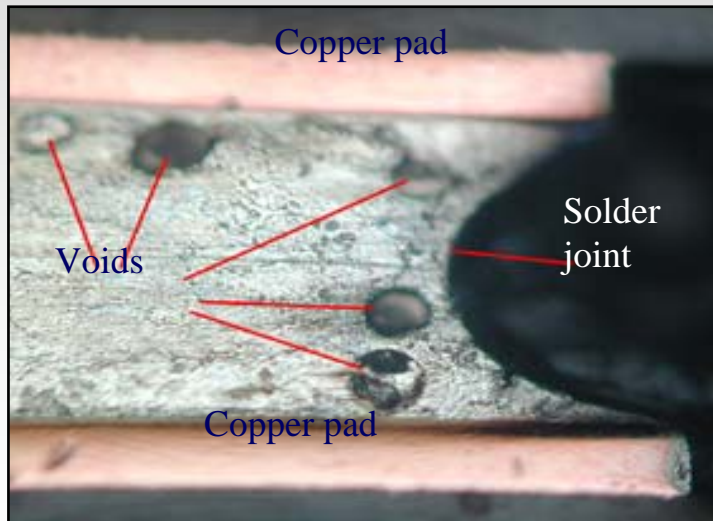
Simulation



# Introduction of SMIT Center

## Lead-free soldering

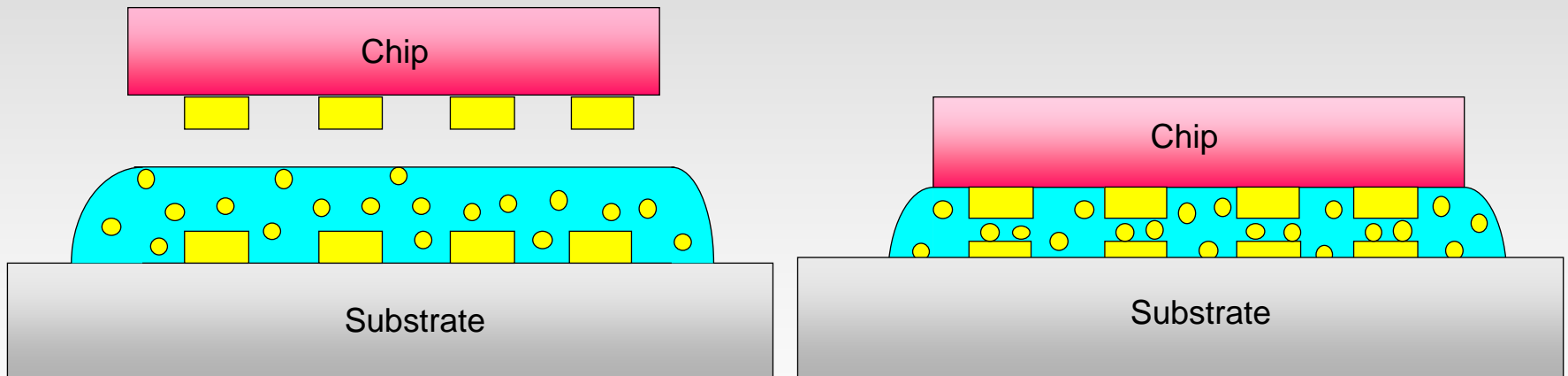
- Developments of new lead free solder based on the Sn-Co-Cu system
- Development of high melting temperature alloy to replace 5Sn95Pb
- Corrosion issues of lead free and Sn/Pb solders
- Low cycle fatigue test of lead free solders
- Simulation and optimization of shape of solder joint



# Introduction of SMIT Center

## Anisotropic conductive adhesive

- ◆ Interconnection materials and technology less than 5  $\mu\text{m}$  pitch and 2.5  $\mu\text{m}$  insulation distance
- ◆ Modelling of stress relaxation mechanisms of ACA interconnect
- ◆ Characterization of adhesion between ACA and bonding surfaces

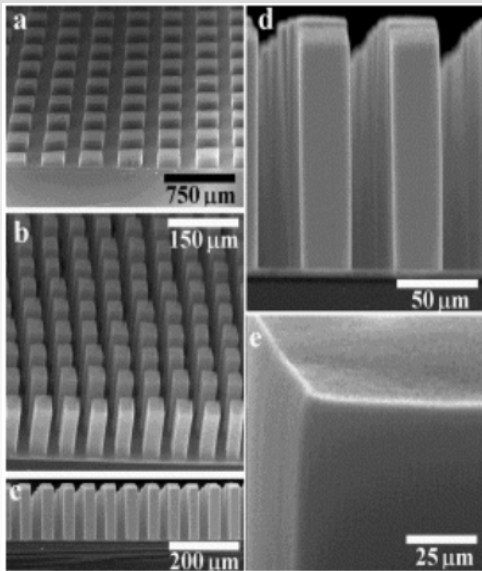


ACA Technology

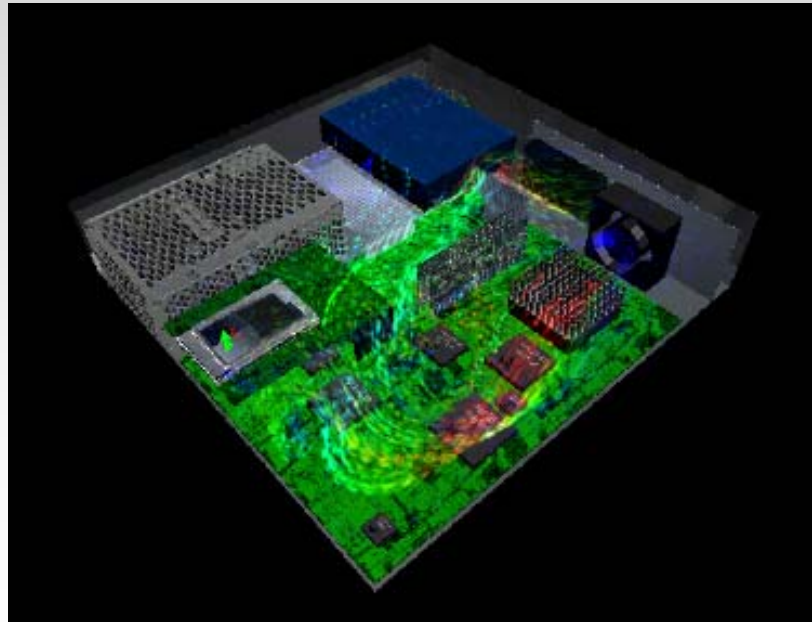
# Introduction of SMIT Center

## Thermal Management

- ◆ Design for component alignment
- ◆ Design for heat sink
- ◆ Carbon nanotube cooler technology. Patent: Aligned CNTs as integrated cooling device ( PNR 0300326-6 )



Heat sink on backside of chip



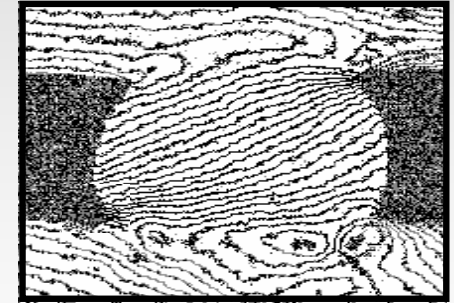
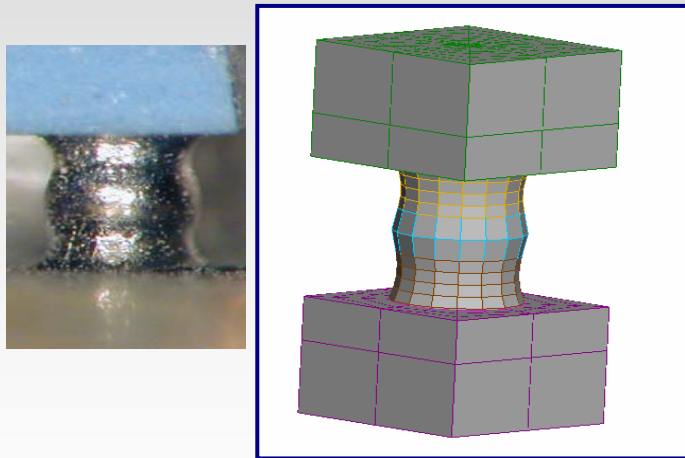
# Introduction of SMIT Center

## Testing under different environmental stress conditions

- ◆ High temperature/High humidity
- ◆ Thermal cycling

## Simulation of thermal mechanical properties

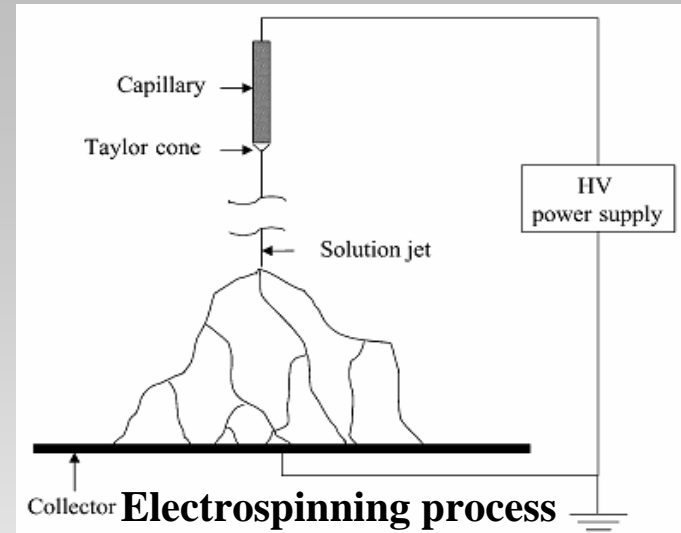
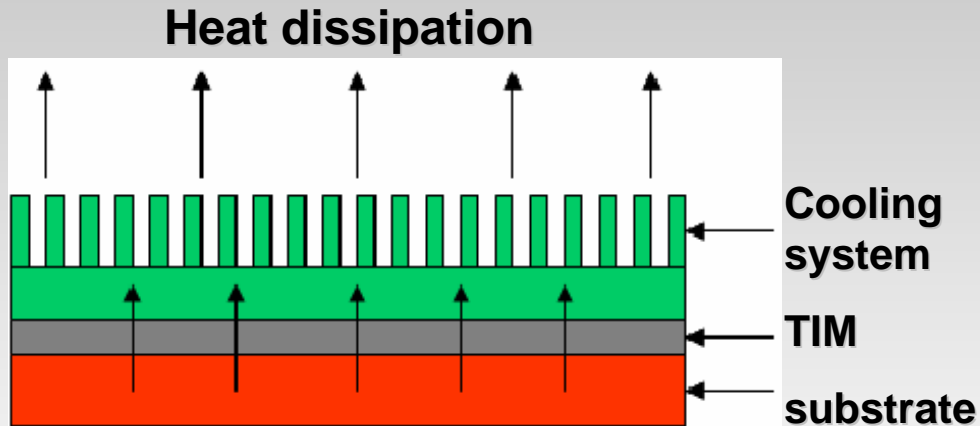
- ◆ Stress/Strain distribution, solder joint lifetime
- ◆ Temperature distribution, thermal dissipation



Local Displacement Field by Micro-Moire Interferometry

# Introduction of SMIT Center

## ❖ Nano-Thermal Interface Material



# Introduction of SMIT Center

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- Reliability of electronic packaging using ACA
- Reliability testing of lead free solder joints
- Reliability of smartcard system with embedded display
- Low-cost LCP (Liquid Crystal Polymer) substrate
- Design and Processing of RF Packaging
- Bumping on chip and Flip-Chip technology
- Modelling, reliability and encapsulation of Oled devices
- High Frequency Modelling of SIP on LCP structures

# The work report

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## ➤ WP1 - Establish Green Electronics Centre of Excellence in China

**Task leader: SU -----finished**

**Name:** China-Europe Green Electronics Cooperation research Center

**Chinese Name:** 中—欧绿色电子合作研究中心



# The work report

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- **Task 1.1** Create a reference group for the Centre of Excellence.

**Task leader: SU-----finished**

**Time:** *from the 1<sup>st</sup> month to the 7<sup>th</sup> month*

*Creation of the Center of the excellence*

*Creation of the reference group for the Center of the excellence : The reference group will aid in recommending specific research topics to be conducted by the Green Electronics Centre of Excellence.*

# The work report

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## ***The reference group members:***

- *Mr QuoQing Fu, Director of International Collaboration, Shanghai Science and Technology Commission, Shanghai Government*
- Guo Liming, Deputy director, Shanghai University, Science and Technology Section*
- *Professr James Morris, Portland State University, Adjunct professor Shanghai University*
- *Mr Shi Yan, Deputy Director, Science and Technology Commission, Congming Island, Shanghai City*
- *Professor CP Wong, Georgia Inst of Technology, USA and Adjunct professor Shanghai University*
- *Tim Chen, Henkel General Manager, China.*

# The work report

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- *Prof. Jialin Cao, President of Shanghai University of Electric Power.*
- *Dr. Dongkai Shangguan, Process director, Flextronics, USA and Adjunct professor, Shanghai University*
- Baiyu Guan, Chief of Department of Electronics and Information Product Administration Division of Integrated Circuit, Ministry of Information Industry, The People's Republic of China
- Yi Wu, Director of Comprehensive Department, Torch High-Tech Industry Development Center, Ministry of Science & Technology, P. R. China
- Jijun Xing, Director for Europe, Department of International Cooperation, Ministry of Science and Technology
- *Liqiang Cao, Manager of Assembly Technology Development, Intel Technology Development (shanghai) Co., Ltd*

# work plan

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- **Task 1.3** Secure the functioning of the Centre of Excellence in Green Electronics on a self-sustainable basis.

Task leader: SU

In the plan

- **Task 3.2** Organize the international symposium on Green electronics.

Task leader: SU

Time: 26th, June, 2007

Place: Shanghai, China

# Work plan

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- **Task 1.2 Develop an exchange program for students and researchers. Task leader: CTU.**
- *Exchange program for researchers:*
- *Interchange researchers for the cooperation on the green electronic research between the partners*
- *Apply projects together from governments and other organizations to support the exchange program*

# Work plan

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*Exchange program for students:*

- *The cooperation between partners in Europe and Shanghai University on PH.D and master Students' Education.*

# Work plan

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- **Task 1.3 Secure the functioning of the Centre of Excellence in Green Electronics on a self-sustainable basis.**

**Task leader: SU**

**Time:** *from the 16<sup>th</sup> month to 24<sup>th</sup> month*

*A plan will be developed for secure the continuous operation of the Centre of Excellence in Green electronics in Shanghai on a self-sustainable basis beyond the project period.*

**Plan:** { *Apply projects from Chinese government and companies.*  
*Continue to apply projects from EC.*  
*Organize conferences on green electronics.*  
*Reference group meeting will be held one or two times per year*

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*Thank you  
&  
Welcome to China!*