Fiscal Year 2011, Tokyo Institute of Technology ASPIRE League Research Grant

Selected Research Projects in FY2011

<table>
<tr><td rowspan="4">Principal Researcher</td><td>Name</td><td colspan="2">**Kikuo KISHIMOTO**</td></tr>
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<tr><td>Position</td><td colspan="2">Professor</td></tr>
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Co-researchers	HKUST	Tong-Yi Zhang, Prof. Department of Mechanical Engineering
	KAIST	Soon-Bok Lee, Prof. Mechanical Engineering
	Nanyang	Shu Dong Wei, Assoc. Chair.
	Tsinghua	Zhuo Zhuang, Prof.

Subject of the research project	**International Joint Research on Integrity Assessment of Multi-Material Structures and Smart Structure Technology**
Summary of the research project	In recent years machines and structures are composed of various materials as the multi-material structures to improve function and performance. For design and production of the long term safety and reliable structures, it is important to understand the mechanical behavior of the multi-material structures such as failure and fracture. In this project, the solid mechanics groups in the ASPIRE league cooperate for the research on health monitoring and smart material. The goal of this international collaboration is to give new insight into the rational design and the production of the smart material with the multi-material structures. Following approaches are applied for developing novel methods for assuring the structures reliability: 1. Material science (analysis and control of the damage and fracture behavior of materials, fabrication of high functionality with surface nano pattern) 2. Manufacturing engineering (control of the bonding and

	separation of structures, development of the smart structures with multilayer lamination)
	3. Design engineering (development and modeling of the complex structures)
	In addition, it is aimed at contributing to sustainable society by means of developing the structural engineering for the multi-material including material design, functional design and structural design through integrating these approaches.