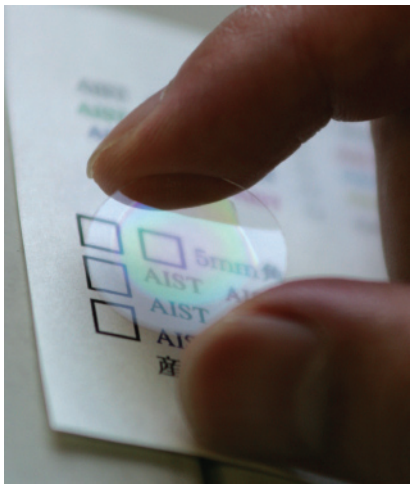
Development of a Transparent Photovoltaic Cell

Transparent pn junctions based on oxide semiconductors have been investigated for transparent solar cells. While most conventional solar cells absorb visible and infrared light to generate electricity, the new photovoltaic cell is designed to simultaneously transmit visible light and convert ultraviolet radiation into electricity. Our innovative photovoltaic cells have the potential of controlling infrared radiation. The infrared radiation carries heat so this device can be developed into a functional window that controls the heat flow into a house. The prototype cell fabricated by the pulsed laser deposition technique is 0.1 square centimeters. AIST plans to develop a larger cell with these features so that conventional glass windows can be replaced by solar sheets of these cells.



A developed transparent photovoltaic cell

Kazuhiko TONOOKA
Nanoelectronics Research Institute
e-mail: tonooka-k@aist.go.jp
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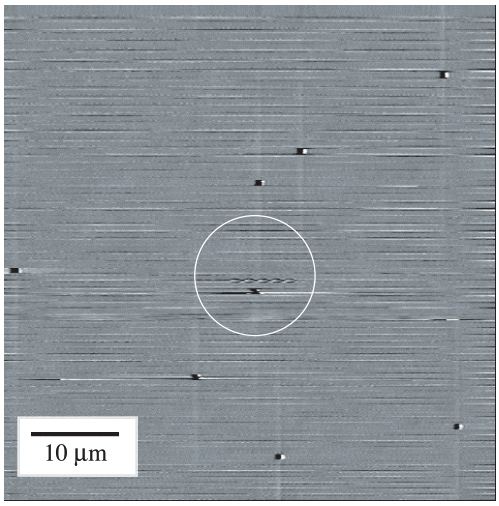
Development of Complex Equipment Combined with an Optical Drive Tester and Atomic Force Microscope

AIST and Seiko Instruments Inc. have developed optical master disk evaluation equipment for an ultra-high density 100 GB optical ROM disk. An optical disk drive tester and atomic force microscope (AFM) were combined.

The evaluation process is the following; the entire master disk is scanned by an optical pickup. The defective pits are found and their positions are recorded. The pits located within the AFM scanning area and their topographies are observed on a nanometer scale. We will improve the equipment for more precise measurement and apply this process to master disk production.



AFM image of randomly recorded pits on the optical disk surface

Masashi KUWAHARA
Center for Applied Near-Field Optics Research
e-mail: kuwaco-kuwahara@aist.go.jp
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