

PREFACE

This annual report reviews the research activities of the Laboratory of Advanced Science and Technology for Industry (LASTI) in the academic year of 2009 (April 2009 –March 2010) including activities using a 1.5GeV synchrotron radiation facility “ NewSUBARU ” at the site of Spring-8 and other research activities of the micro and nanoscale are carried out energetically in CAST building.

Topics of the NewSUBARU research activities of this year are as follows. First is the basic characteristic research of NewSUBARU electron storage ring and imaging with laser Compton scattering Gamma-ray. The second is EUV (extreme ultraviolet) activities that are a mask observation using a coherent EUV scattering microscope, nanostructure pattern replication by newly developed EUV interference lithography system, and development of new EUV resist with low LER(Line edge Roughness). BL09C beamline was branched from BL09B beamline for usage of the EUV interference lithography for evaluation of the exposure characteristics of EUV resist. Third is micro- and nano-devices such as a high-aspect ratio micro-coil, three-dimensional lab-on-CD and X-ray grating for X-ray Talbot interferometer. Fourth is the material science for various materials such as hydrogenated DLC, a-C:H and BN.

Furthermore, the performance of analysis beam line BL5 for industrial enterprises was evaluated by NEXAFS spectra measurements using the standard samples of graphite, BN, LiCl and MgO.

Most of our research activities are being conducted in collaboration with industries, government research institutes and other universities.

We will continue to respond to the community’s demand by offering new science and technologies.



A handwritten signature in black ink that reads "S. Matsui". The signature is written in a cursive, flowing style.

Shinji Matsui
Director of LASTI