

PREFACE

This annual report reviews the research activities of the Laboratory of Advanced Science and Technology for Industry (LASTI) in the academic year of 2011 (April 2011 –March 2012) 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 raise of the top-up beam current at 1.0 GeV, from 220 mA to 250 mA. This was achieved by better injection efficiency and longer beam life due to improvements of magnetic optics matching and resolution of beam monitor. The second is achievements of "Center of EUVL" that are an interferometric exposure system for evaluate the 10 nm class lithography and an imaging system for EUV-mask patterns using coherent EUV scatterometry microscope based on coherent diffraction imaging. Third is developments of micro- and nano- structure fabrication technology. Devices such as a medical monitoring, an automated biological analysis and a micro-TAS (total analysis system) are developed using microfluidics and variety of sensing methods. At the end of fiscal year 2011, "Center of LIGA Process" was organized for further developments and applications of this technology. Fourth is developments from "Center of Nano-Inprint Technology". Basic properties of mass fabrication technique of nano structure surface are developed.

Furthermore, most of our research activities are being conducted in collaboration with industries, government research institutes and other universities. NewSUBARU beamlines, especially an industrial analysis beamline BL05, is intensively used by companies for material analysis. We will continue to respond to the community's demand by offering new science and technologies.



A handwritten signature in cursive script that reads "Shuji Miyamoto".

Shuji Miyamoto
Director of LASTI