

**Study Visit to the
National Oceanography Centre
Southampton, UK**

22 September to 28 November, 2006

**by
Ir. Sritama Sarkar**

1.0 Introduction

The Young Researcher Bursary Program under the Collaborative Autosub Science in Extreme Environments (CASEE program) aims at developing collaborative links between UK and overseas scientists and engineers working in the field of underwater technology.

Ms. Sritama Sarkar, a doctoral student in the Ocean and Naval Architectural Engineering from the Memorial University of Newfoundland, St. John's, Canada is one of the six candidates who got selected under the CASEE program in the year 2006.

Sritama worked for a period of 8 weeks during the months of September to November, 2006 with the Autosub team in the National Oceanography Centre, Southampton, UK. As part of the CASEE program, Sritama attended the 8th Unmanned Underwater Vehicle Showcase held on 27 – 28 September, 2006 in the National Oceanography Centre, Southampton, UK. She also visited the Scottish Association for Marine Sciences together with a team from the National Oceanography Centre to get involved with the “Gavia” trials. Mr. Alex Forrest, a Ph.D. candidate from the University of British Columbia came with the small autonomous underwater vehicle “Gavia” to perform trials in the inlet waters of Loch Etive, Scotland. Mr. Forrest is another candidate who was selected under the CASEE program for the year 2006.

2.0 Work with the Autosub team

During the first week of her visit, Sritama attended the “Autosub Program review” meetings. This gave her the opportunity to gain a quick insight into the current works going on with the Autosub 3 and the Autosub 6000 as also the future works planned for new developments.

Currently the Autosub team is involved in designing and building the Autosub 6000, which will be capable of working to a depth of 6000 m. The Autosub team is also planning to go for sea trials during the months of February – March, 2007 with their present autonomous underwater vehicle Autosub 3. Presently, the Autosub team is testing and integrating various components and sensors for the Autosub 3 as also for the Autosub 6000. The team is also working with the processing of the mission data gathered by the Autosub during various missions.

During her stay in the National Oceanography Centre, Ms. Sarkar thus got familiarized with the different systems of the Autosub 3 as also the various sensors used by the autonomous underwater vehicles. Ms. Sarkar had extensive discussions with the Autosub team members. Such interactions helped her to understand the operation and mission planning concepts used by the Autosub. The discussions also encompassed under ice operations and surveys with the Autosub and the problems faced during such operations. Ms. Sarkar also learnt about the hardware and software used for the operation and control of the Autosub.

Ms. Sarkar helped the Autosub team with the post processing of the data gathered by the Autosub 3 during its various previous missions. The post processing of the data requires writing software using Matlab and then analyzing the processed data. The communications with the Autosub team members during the post processing of the data helped Ms. Sarkar to understand the inherent problems of the raw logger data collected by the Autosub as also the way the different systems and sensors work. Post processing of raw logger data is essential for the development of offline fault identification tools for the Autosub.



Figure 1 From left to right: Maaten Furlong, Pete Stevenson, James Perret, Miles Pebody, Steve McPhail and Sritama Sarkar

3.0 Unmanned Underwater Vehicle Showcase

Ms. Sritama Sarkar attended the Unmanned Underwater Vehicle Showcase, which was held in the National Oceanography Centre during 27 – 28 September, 2006. This was a nice opportunity for Ms. Sarkar to know about the recent developments in the underwater vehicles technology.

4.0 Gavia trials in Loch Etive, Scotland

Mr. Alex Forrest from the University of British Columbia performed the Gavia trials in association with the Scottish Association for Marine Sciences in the inlet waters of Loch Etive, Scotland. During the Gavia trials, Mr. Forrest was joined by Mr. Steve McPhail, Dr. Miles Pebody, and Dr. Maaten Furlong from the National Oceanography Centre, Southampton, UK, Dr. Jeremy Wilkinson from the Scottish Association for Marine Science and Ms. Sritama Sarkar.

The Gavia trials were carried out on November 1, 2006. Initial data analyses and discussions on the problems encountered during the Gavia trials were carried out on November 2, 2006. These interactions helped in understanding the advantages and disadvantages of small autonomous underwater vehicle operations, and whether such vehicles can be used for under ice operations. As a consequence of such collaborative works, it was possible to perform comparisons between the different systems of larger autonomous underwater vehicles like

Autosub and smaller autonomous underwater vehicles like Gavia. Such comparisons included but not limited to launching and recovery operations, transportation of the vehicle to the desired area, operation and control of the vehicle as also the sensors used.

During the data analyses phase, it was possible to look into the software developed for the vehicle configuration, mission planning and mission data post processing for the Gavia.



Figure 2 Gavia trials

5.0 Student AUV

Ms. Sritama Sarkar also got a chance to see the student autonomous underwater vehicle “Suave” from the Southampton University, which was designed and built for the European student AUV competition SAUC-E 2006.

6.0 Conclusions

The Young Researcher Bursary Program under the Collaborative Autosub Science in Extreme Environments (CASEE program) provided excellent opportunity for interactions and networking between young scientists and engineers from different parts of the world who are involved with underwater vehicles research.

Through this program, it was possible to know the people who are actively involved with the designing, building, testing and operating autonomous underwater vehicles in the United Kingdom.

The collaborative Gavia trials helped in comparing larger autonomous underwater vehicles with smaller autonomous underwater vehicles. Such comparisons are necessary for any future development or new design of both smaller and larger underwater vehicles.

The Young Researcher Bursary Program helps young professionals to gain first hand knowledge in autonomous underwater vehicle development and operation and thus in contributing towards development of new underwater technology.