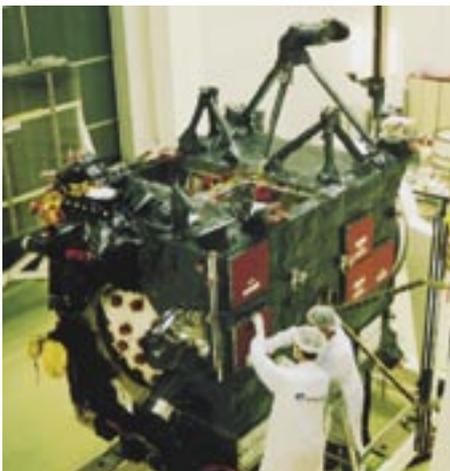


Narrow Angle Camera - a subsystem of ESEO

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*Later, they may be
working with large
satellites like Rosetta. Here
in the integration hall at
ESTEC.
Photo: Nordicspace*



In late 2002 three students, from what was then the Department of Space Physics at Umeå University in Kiruna, took on the task to develop and build a narrow angle camera for the European Student Earth Orbiter. By invitation from the former system engineer of the project, they accepted the challenge since the position had been vacant for some time. These three soon became four and about a year later the team included seven members, all of whom studied at the Department of Space Science. Since then the team has recruited additional members and so far only lost one, making it the team that has lasted for the longest time in SSETI history, where generations of teams come and go due to graduation and the relatively short time a student attends university.

All the work done by the team members is on a voluntary basis in their own time with very small possibilities to get any academic credits for it. However, the experience from a real satellite project is challenging and hopefully something future employers will appreciate.

Tobias Ohlsson has been working on and off on a B.Sc in Space Engineering at the Dept. of Space Science in Kiruna since 1999. He joined the NAC-team in 2003, and aged 26 he is the oldest member of the team.

The camera is one of the major payloads onboard the ES, and was originally planned to be one of two cameras. A wide-angle camera was cancelled earlier in the project leaving the narrow angle camera to be the only earth-observing payload onboard the spacecraft. The images will be in 10-bit greyscale with a maximum of 1 mega pixel.

With a field of view angle of 8.3 degrees the maximum area covered from geostationary transfer orbit will be approximately the size of Europe. Due to the GTO, none of the pictures will be of Europe itself, but of areas around the equator. The main task for the NAC is to provide SSETI with images to show the public, and particularly younger students, to increase the interest in space related science and technology. Greyscale pictures of places few Europeans have ever been to might not be the best way to catch people's interest, especially since cameras in mobile phones will have a higher resolution by the time ESEO is launched (1Mpixel greyscale equals 3-4Mpixel in colour). However, it is by far more impressive due to the fact that students built the camera, and should be interesting enough to get other students involved in future SSETI missions like the European Student Moon Orbiter.

One of the major challenges in a project like this is to get the proper funds, making it slightly different from other projects at the university. For example, reasonable memory modules are available for about EUR1 if they are to be used for a typical terrestrial electronic circuit, but space qualified ones cost about €300 plus VAT. Some components for the camera had been donated to the team; others will be industry class products with external shielding applied. This is one of the advantages of being located next to the Institute of Space Physics in Kiruna; the experienced staff has many useful suggestions to problems most students cannot even dream of. When the team joined the project, the Swedish National Space Board gave its blessing by granting a few thousand Euro for components and other expenses. The regular trips to Estec in the Netherlands are paid by ESA through SSETI for two team members at a time. Otherwise, most matters are handled over the Internet, both internal team business and for the project as a whole. Since there is no room for "the usual space qualified stuff", the students learn "the hard way", preparing them for future tasks whether it is in the space industry, or not. At least they "make their appearance" in the field the studies are aimed for.