



# International Amateur Radio Union Region 1 2011 Regional Conference – Sun City, South Africa 12 to 19 August 2011



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| Subject    | Coordination of Ground Stations for Educational Space Satellite Projects of Universities |               |             |
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## Educational Space Satellite Projects of Universities

Today there are dozens of university student groups around the world building micro (10 – 50 kg) and nano (1 – 10 kg) satellites for scientific research and as technology demonstrators. These satellites provide tremendous educational opportunities for the students.

The CubeSat standard is already the second generation of such projects. To briefly summarise in 2000, Profs Bob Twiggs (then at Stanford) and Jordi Puig-Suari (California Polytechnic State University - San Luis Obispo) defined a new set of standards for very small student-built spacecraft; the intent was that students could build and fly a spacecraft within their academic lifetimes. Standard sizes and performance specifications were also intended to encourage collaboration between schools. The first CubeSats were launched in 2003 and 6 years later (a blink of the eye in aerospace time), more than forty have flown.

## Ground Stations

A ground station network is a collection of earth stations networked together for the purpose of transmitting and receiving data to and from satellites. The main benefit of this approach is to dramatically increase the amount of data that can be downlinked or uplinked to a satellite, as well as increasing control of operations for satellite owners.

Due to the absence of a global network of ground stations, the amount of data downloaded from CubeSats in orbit right now is unfortunately very small.

## The solution

Some groups are trying to combat this data deficiency by networking many ground stations, similar to the ground station in Alaska for QuakeSat-1 but over a much larger scale. The Global Educational Network for Satellite Operators (GENSO) project aims to link hundreds of low cost amateur radio ground stations via the internet. It will also allow remote control of satellites from ground stations around the world, greatly increasing satellite health knowledge.

Such or similar initiatives urgently need the backing and support of the international amateur radio community, thus IARU.

## The benefit for amateur radio

This initiative not only provides the scientific community with a much appreciated, valuable, extremely cost efficient and most welcomed service, but at the same time helps to bridge the gap between amateur radio and universities. As a result, many more science students will get in contact with amateur radio, many of them will get their own amateur radio licenses. Furthermore, the amateur radio service will enhance its role and recognition as a service to the public.

## **Proposal**

USKA proposes that IARU will create a study group to further discuss which coordination roles IARU could pursue in order to support and/or coordinate a global amateur radio ground station network for university satellite projects.