

## **Proposal for Forming an IAA Study Group 4.18**

**Title of Study:**

Definition and Requirements of Small Satellites Seeking Low-Cost and Fast-Delivery

**Proposer(s):**

*(Must be member(s) of the Academy M or CM)*  
Mengu Cho (CM) and Filippo Graziani (M)

**Primary IAA Commission Preference:**

*(From Commission 1 to Commission 6) Commission 4*  
*Commissions: 1 Space Physical Sciences, 2 Space Life Sciences, 3 Space Technology & Systems Development, 4 Space Systems Operations & Utilization, 5 Space Policy, Law & Economics, 6 Space and Society: Culture and Education*

**Secondary IAA Commission Interests:**

*(From Commission 1 to Commission 6) Commission 3*

**Members of Study Team**

**Chair(s):** Mengu Cho, Filippo Graziani

*(Must be member(s) of the Academy, M or CM)*

**Secretary:** John Polansky, Kyushu Institute of Technology

**Other Members:**

*(Open to members and non- members of the Academy)*

Jordi Puig-Suari, CALPOLY

Rainer Sandau

Chantal Cappelletti, GAUSS Srl

Shinichi Nakasuka, University of Tokyo

Tetsuo Yasaka, QPS

Seiko Shirasaka, Keio University

Stephan Stolz, Astro-und Feinwerktechnik Adlershof GmbH

Fernando Stancato, Embraer

Paolo Teofilatto, Sapienza University of Roma

Mauro Pontani, Sapienza University of Roma

Zheng Gangtie, Tsinghua University

Daniel Rockberger, IAI

Akshay Gulati, Indian Institute of Technology Madras

Laurent Dusseau, University of Montpellier

David Finkleman, Center for Space Standard and Innovation

Joseph C. Casas, NASA

Naomi Mathers, Australian National University

Low Kay Soon, Nanyang Technological University

Zulkifli Abdul Aziz, Astronautic Technology (M) Sdn. Bhd.

Artur Sholz, ??  
Freddy Pranajya, University of Toronto  
Fernando Agelet, Unveristy of Vigo  
Jyh-Ching Juang, National Cheng Kung University  
Herman Steyn, Steyn Bosch University  
Jongho Seon, Kyogn-hee University  
Cesar Bernal, ISIS  
Werner Balogh, United Nations Office for Outer Space Affairs  
TBD university in UK  
TBD university in Germany

### **Short Description of Scope of Study**

#### **Overall Goal:**

*(Expected scientific or practical benefit of the study group's efforts)*

In recent years, explosive growth of small satellites launch raises concern over space debris and safety. Small satellites range from a 1kg Cubesat to a satellite weighing well over 100kg, but have a common characteristic of low-cost and fast-delivery. In the past, small satellites, especially the smaller ones, have been used for educational or experimental purposes. Nowadays, however, even commercial Cubesats are envisioned. Commercial usage of small satellites raises concern over reliability as they cannot assure the same level of reliability as traditional large/medium satellites. In 2014, an activity started at ISO/SC14 to make an ISO standard that defines what is a small satellite and sets requirements for small satellites to answer those concerns and lay down the foundation of commercial activities utilizing small satellites. Although the ISO activity is intended for commercial satellites, satellites of educational or academic purpose may be affected by this standard. Inputs from the communities related to small satellites, especially university satellites and emerging countries to the ISO activity are highly sought-after. The study group will examine the definitions of small satellites that vary depending on countries or professions and try to reach consensus. The study group also differentiates the requirements every satellite should follow regardless its size from the requirements small satellites should have separately from the traditional satellites to keep their nature of low-cost and fast-delivery.

Practical benefit of this study group is to promote further growth of small satellite activity by clarifying the definition and requirements of small satellites that have been ambiguous and the source of confusion.

#### **Intermediate Goals:**

#### **Methodology:**

*(Email works, workshops, stand alone conferences, interim publications, etc.)*

A workshop will be held once a year (November or December) in Japan.  
In addition, the study group will meet regularly at

- International Astronautical Congress

**International Academy of Astronautics (IAA)**

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Instructions and application form: see: "Scientific Activity" section at <http://iaaweb.org/content/view/256/393/>

- IAA Spring meeting
- IAA Symposium on University Satellites Missions in Rome
- United Nations Symposium on Basic Space Technology
- Nanosatellite Symposiums in Japan
- Other Cubesat and Micro-sat related workshops and conferences

E-mail list and a file-server will be utilized to exchange opinions and materials. The study group activity is coordinated with ISO/SC14 activity on small satellite standard.

**Time Line:**

*(Cannot exceed three years)*

The study is expected to be completed in two years.

**Final Product (Report, Publication, etc.):**

Report will be published and distributed worldwide.

**Target Community:**

International Standard Organization Subcommittee 14 (Space System), Small Satellite manufacturers, Small business, University satellite developers, Traditional satellite manufacturers, Launch providers, Satellite operators, Space agencies, International Telecommunication Union

**Support Needed:**

None identified at this time

**Potential Sponsors:**

This work is supported by Ministry of Economy, Trade and Industry, Japan.

To be returned to the IAA Secretary General Paris

by fax: 33 1 47 23 82 16 or  
by email: [sgeneral@iaamail.org](mailto:sgeneral@iaamail.org)

**Date:**

**Name:**

*(No Signature required if document authenticated).*

**International Academy of Astronautics (IAA)**

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Instructions and application form: see: "Scientific Activity" section at <http://iaaweb.org/content/view/256/393/>

**Follow-up Section for IAA use only**

**Initial Phase**

**Application received:**

**Commission Approved:**

**SAC Approved:**

**Web Site Section opened:**

**Members Formally Appointed by IAA:**

**Final Phase**

**Peer Review by Commission Completed:**

**Recommended by the Commission:**

**Final Report Received:**

**SAC Approved:**

**BOT Accepted:**

**Publisher Selected:**

**Study Published:**