

updated 24<sup>th</sup> Aug. 2017

# 9th Multi-GNSS Asia (MGA) Conference

Next Generation Multi-GNSS Resilient Solutions for  
Sustainable Development

9 October -11 October 2017  
Jakarta, Republic of Indonesia

## MULTI-GNSS ASIA

Jointly organised by:



Supported by:





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# WELCOME

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Prof. Ta Hai Tung  
Chairman

I am pleased to welcome you to the 9th Multi-GNSS Asia conference in Jakarta, Indonesia, on 9-11 October 2017. This annual conference comes at a time in which the great opportunities that can be offered by the multi-GNSS environment are increasingly materializing since such environment is becoming more and more real. Over the past year the European Galileo system has started its initial services, the Japanese QZSS has been extended with a second satellite, the Chinese BeiDou is continuing to be developed, while the US backed GPS and the Russian GLONASS are constantly maintained and modernized.

This environment paves the way to enhanced applications and services in all fields in which the crosscutting GNSS technology is exploited. New studies and developments of industrial solutions are ongoing throughout the world to take out the most from the multi-GNSS environment. The MGA conference is a dedicated forum to present them and to discuss state of the art technology and solutions. This is done with contributions from industry, academia and governmental stakeholders: three components that are essential for identifying solutions suitable for a sustainable and friendly development. Since its first edition, the Conference has a special focus on the dynamic Asia Pacific Region. I am therefore very pleased that this year the MGA Conference is held for the first time in Indonesia, an important player in the Region. In this regard, I would like to express my deep appreciation to the Indonesian Space Agency LAPAN that is acting as the distinguished local organizer of the event.



Prof. Teruyuki Kato  
Chairman

Welcome to the MGA 2017 conference in Jakarta, Indonesia! This is the 9th conference on multi-GNSS in Asia and Oceania. I am personally all the more pleased that the MGA conference is to be held in Indonesia, as I have been working together with Indonesian colleagues for years on GNSS applications for earthquake monitoring. The Indonesian archipelago is under constant threat of natural hazards such as earthquakes, tsunamis, volcanic eruptions as well as landslides, etc. Multi-GNSS technologies provide powerful tools for monitoring those natural hazards and yet further developments are to be expected in the future to this end. I do believe that this conference will be a good opportunity for researchers and other participants to discuss ways to build a safer and more secure society against natural disasters using multi-GNSS. Needless to say, multi-GNSS environments have much wider areas of applications in industries such as vehicle control, intelligent transportation systems, land based service, etc. Asia and Oceania are the regions where multi-GNSS environments can most effectively be utilized in the world. In striving toward this goal, strong collaborations among academia, industry, and governments is indispensable. To this end, this conference aims to provide a forum among these three sectors. The success of the MGA conference is thus a key to leading the world in the field of multi-GNSS. I believe that the conference will provide great opportunities and exciting experiences to all the participants. Enjoy it!



# WELCOME

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Ms. Clara Yatini  
Local Organizing Committee Chair

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On behalf of the local organizing committee of the 9th MGA Conference, we would like to welcome you to Indonesia. The theme of the conference is “Next-Generation Multi-GNSS resilient solutions for sustainable development” as the country is moving forward to an era in which GNSS plays an important role in exploring potential growth areas for national development. Satellite navigation and positioning data are now used in a wide range of areas that include mapping and surveying, monitoring of the environment, precision agriculture and natural resources management, disaster warning and emergency response, aviation, maritime and land transportation and research areas such as climate change and ionospheric studies. It offers a cost-effective way of pursuing sustainable economic growth. In this conference we invite people from government, academia and industries who are interested and involved in satellite navigation to share their experience in GNSS to gain more understanding in GNSS applications and benefits.



# INTRODUCTION

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- meet leading companies in various GNSS application fields.
- network with leaders, professionals, and entrepreneurs.
- acquire latest information on GPS, QZSS, Galileo, GLONASS, BeiDou, and Navic.
- learn firsthand about system capabilities, future technical trends, new life styles....
- participants include industries, space agencies, researchers, students, and GNSS users from Indonesia and SEA.
- exchange your ideas, demands, and views, discuss solutions to social issues using GNSS, GIS, and Space technologies.

We are pleased to announce that the 9th Multi-GNSS Asia Conference will be held on 9<sup>th</sup>-11<sup>th</sup> October 2017 at the AYANA Midplaza Jakarta in Jakarta, Republic of Indonesia.

The main theme of this year's conference will be "**Next Generation Multi-GNSS Resilient Solutions for Sustainable Development**" and our goal is to enhance cooperation between governments, industry and academia. As in previous years, technical trends in Multi-GNSS, potential GNSS applications in the region, activity reports from MGA participants, and MGA future activities will be presented. Those who are interested in making a presentation, please send a one-page abstract to the secretariat of the conference **by 31<sup>st</sup> August 2017** (a paper of a maximum of 4 pages which will be made public online as conference proceedings can also be submitted on a voluntary basis).

For registration and updated information on the agenda and venue, please kindly visit our website:

[www.multignss.asia/conference.html](http://www.multignss.asia/conference.html)

We look forward to seeing you in Indonesia.

Sincerely,

MGA Conference Secretariat



# CONFERENCE INFORMATION

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- Date:** 9<sup>th</sup> - 11<sup>th</sup> October 2017
- Place:** Jakarta, Republic of Indonesia
- Venue:** AYANA Midplaza Jakarta  
<http://www.ayana.com/en/jakarta/ayana-midplaza-jakarta>
- Participation:** There is NO participation fee to join the conference.
- Capacity:** Seating capacity is limited to 200 people. Note that the registration for the MGA Conference will be accepted on a first-come-first-served basis.
- Registration:** **To register, please access “Registration for the MGA Conference” on the Conference Web page. (<http://www.multignss.asia/conference.html>)**  
We recommend registering for smooth entry. We are afraid no name badge will be provided to those who have not registered in advance.  
For those who need to obtain a visa and need the support from the MGA secretariat, please complete your registration on the MGA website by Tuesday, 15<sup>th</sup> August 2017.
- Inquiries:** If you have any inquiries concerning the MGA Conference, please contact:  
Kazutoshi Sato (Dr.), Takehisa Chiba (Mr.)  
MGA Conference Secretariat  
c/o Japan Aerospace Exploration Agency (JAXA)  
2-1-1 Sengen, Tsukuba, Ibaraki, 305-8505 Japan  
email: [secretariat@multignss.asia](mailto:secretariat@multignss.asia)
- Further Info:** <http://www.multignss.asia/conference.html>



## IMPORTANT DATES

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# PROGRAMME AGENDA

	9 <sup>th</sup> October (Day 1)	10 <sup>th</sup> October (Day 2)	11 <sup>th</sup> October (Day 3)	
	Ballroom A or B	Jasmine 1-3	Jasmine 1-3	
9	9:00-10:00 <b>Opening Ceremony</b>	9:00-10:30 <b>Multi-GNSS Industrial Developments and Applications (I)</b>	9:00-10:30 <b>Multi-GNSS Applications in Indonesia and in the Asia-Pacific Region - ITS (III)</b>	9
10	Photo Session + Coffee Break			10
11	10:30-12:40 <b>Plenary Session (GNSS Update + Announcement)</b>	Coffee Break	Coffee Break	11
12		11:00-12:30 <b>Multi-GNSS Industrial Developments and Applications (II)</b>	11:00-13:00 <b>Multi-GNSS Applications in Indonesia and in the Asia-Pacific Region - LBS/Others (IV)</b>	12
13	12:40-13:30 Lunch time (Poster & Exhibition)	12:30-13:30 Lunch time (Poster & Exhibition)	13:00-14:00 Lunch time (Poster & Exhibition)	13
14	13:30-15:30 <b>Latest Trends in Multi-GNSS Technology and Research (I)</b>	13:30-15:30 <b>Multi-GNSS Applications in Indonesia and in the Asia-Pacific Region - PP (I)</b>	14:00-15:00 <b>MGA Annual Activity Report</b>	14
15	Coffee Break	Coffee Break	15:00-16:00 <b>Closing Session</b>	15
16	16:00-18:00 <b>Latest Trends in Multi-GNSS Technology and Research (II)</b>	16:00-18:00 <b>Multi-GNSS Applications in Indonesia and in the Asia-Pacific Region - DMM (II)</b>		16
17				17
18	18:00-20:00 <b>Students and Young Professionals Forum (Ideathon) [closed]</b>	18:00-18:30 <b>Students and Young Professionals Forum (Presentation)</b>		18
19				19
20		19:30-21:00 MGA Reception at Ballroom A or B		20
21				21

## NOT REGISTERED YET?



<http://www.multignss.asia/conference.html>





## PROGRAMME DETAILS

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# Opening Ceremony



09:00-10:00, Monday 9<sup>th</sup> October 2017



Ballroom A or B



Ms. Clara Yatini, Local Organizing Committee Chair

09:00 – 09:10	Opening remarks Dr. Ta Hai Tung, Chairman of MGA
09:10 – 09:20	Welcome speech Ministry of Research and Technology, Republic of Indonesia (TBC)
09:20 – 09:30	Welcome speech Prof. Dr. Thomas Djamaluddin, Chairman of the National Institute of Aeronautics and Space/Lembaga Penerbangan dan Antariksa Nasional (LAPAN)
09:30 – 10:00	Keynote speech Prof. Dr. Ir. Hasanuddin Z. Abidin, Chairman of Badan Informasi Geospasial (BIG)



# PROGRAMME DETAILS



## Plenary Session



10:30-12:40, Monday 9<sup>th</sup> October 2017



Ballroom A or B



Prof. Teruyuki Kato, Univ. of Tokyo, Japan

## Overview

In the plenary session, stakeholders from government agencies will present their latest GNSS technologies, space applications as well as their space policies under the theme of the Multi-GNSS Asia conference “Providing the Solutions using Multi-GNSS and Other Space Applications in the Asia-Pacific Region”. Furthermore, as the Multi-GNSS Asia Conference is aimed at strengthening mutual cooperation between industry, governments and academia, their experiences and cooperation opportunities will be discussed.

## Programme

10:30 – 12:40

Multi-GNSS for Space Users: NASA’s Role in Enhancing PNT

Speaker:

James J. Miller, Policy & Strategic Communications Division with the Space Communications and Navigation Program at NASA Headquarters

Latest update of GLONASS (Tentative Title)

Speaker: Mr. Ivan Revnivkykh, GLONASS Applications Department, ROSCOSMOS State Space Corporation

Latest update of Galileo (Tentative Title)

Speaker: Mr. Pieter De Smet, Galileo and EGNOS-Applications, Security, International Aspects, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, European Commission

Latest update of BeiDou (Tentative Title)

Speaker: TBC

Latest update of IRNSS (Tentative Title)

Speaker: TBC

Latest update of QZSS (Tentative Title)

Speaker: TBC



## PROGRAMME DETAILS

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# Latest Trends in Multi-GNSS Technology and Research



13:30-18:00, Monday 9<sup>th</sup> October 2017



Ballroom A or B



Dr. Ta Hai Tung, HUST, Vietnam

Prof. Teruyuki Kato, Univ. of Tokyo, Japan

## Overview

This session offers the opportunity to researchers and technicians from industry, research institutions, and universities to share their view on the latest trends in RTD activities in the field of Multi-GNSS technology and its applications, providing insight on results and solutions that could be embedded in coming services, industrial products, and applications. The Session will feature presentations by Asian and European technicians and researchers.

## Programme


13:30 – 18:00    Coming soon





## PROGRAMME DETAILS



# Students and Young Professionals Forum

 18:00-20:00, Monday 9<sup>th</sup> October 2017 [Closed]  
18:00-18:30, Wednesday 10<sup>th</sup> October 2017

 Ballroom A or B (Monday 9<sup>th</sup>)  
Jasmine 1-3 (Wednesday 10<sup>th</sup>)

 Dr. Naohiko Kohtake, Keio Univ., Japan  
Dr. Ta Hai Tung, HUST, Vietnam

## Overview

The second MGA Students and Young Professionals Forum (MSY2017) is a workshop for university students and young researchers who are engaged and interested in GNSS activities in the Asia-Pacific region. The goal of this workshop is to strengthen the regional network of the students and young researchers, and to consider the possibilities and issues in the Asia-Pacific region that the regional GNSS community is facing and to provide inputs from the next generation of stakeholders in GNSS activities. In order to achieve such goals, this workshop expects participants from various countries, background (engineering, science, business, marketing, international relations and related fields), and organizations (such as public sectors, NGOs, companies, and academic institutions).

## Programme

Monday 9<sup>th</sup>

18:00 – 20:00    1. Remarks  
                          2. Networking  
                          3. Ideathon  
                          4. Conclusion

Tuesday 10<sup>th</sup>

18:00 – 18:30    5. Presentation



## PROGRAMME DETAILS


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# Multi-GNSS Industrial Developments and Applications

 09:00-12:30, Tuesday 10<sup>th</sup> October 2017

 Jasmine 1-3

 Mr. Rainer Horn, GNSS.asia, Germany  
Ms. Bärbel Deisting, bavAIRia e.V., Germany

## Overview

The session titled "Multi-GNSS Industrial Developments and Applications" will feature presentations by key European and Asian players from GNSS companies on trends and international cooperation opportunities in Multi-GNSS.

## Programme




09:00 – 12:30    Coming soon



## PROGRAMME DETAILS



# Multi-GNSS Applications in Indonesia and in the Asia-Pacific Region

-  13:30-18:00, Tuesday 10<sup>th</sup> October 2017  
09:00-13:00, Wednesday 11<sup>th</sup> October 2017
-  Jasmine 1-3
-  Prof. Teruyuki Kato, Univ. of Tokyo, Japan  
Dr. Ta Hai Tung, HUST, Vietnam

## Overview

The world of GNSS is now entering into a new era of Multi-GNSS. In this new era, various new challenges and developments are expected. The first challenge is to develop new algorithms and strategies of using plural GNSS systems, in particular those that are able to provide resilient GNSS solutions for users worldwide.

Applications of multi-GNSS data for new fields of science and engineering are also to be challenged. In particular, cm accuracy positioning of moving platforms in real-time is one of the most promising fields of using multi-GNSS. Asia and Oceania are the most promising areas of such applications where the largest numbers of GNSS satellites are expected to be available. Thus, the MGA 2017 Conference tries to provide a forum among related researchers to introduce their new results, share new ideas and plans, and exchange information on multi-GNSS under the theme of "Next Generation Multi-GNSS Resilient Solutions for Sustainable Development". Any related topics are solicited for presentation, in particular, but not limited to, the following four topics; precise positioning (PP), intelligent transport system (ITS), disaster mitigation and management (DMM), and location based services (LBS).

## Programme

Tuesday 10<sup>th</sup>

- 13:30 – 15:30      Precise Positioning (PP)  
16:00 – 18:00      Disaster Management (DMM)

Wednesday 11<sup>th</sup>


- 09:00 – 10:30      Intelligent Transport System (ITS)  
11:00 – 13:00      Location Based Service (LBS) and Others



## PROGRAMME DETAILS



### MGA Reception

 19:30-21:00, Tuesday 10<sup>th</sup> October 2017

 Ballroom A or B

 MGA Secretariat

**Join US**

### Programme

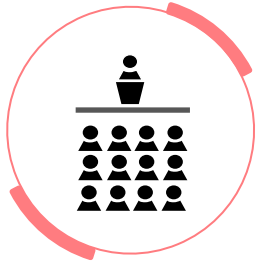
- ✧ Welcome Speech
- ✧ Toast
- ✧ ESNC GNSS.asia Prize Ceremony
- ✧ Others






## PROGRAMME DETAILS


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# MGA Annual Activities Report

 14:00-15:00, Wednesday 11<sup>th</sup> October 2017

 Jasmine 1-3

 MGA Secretariat

## Overview

In this session, we will introduce several projects in an annual report of MGA activities. We will also report on the GNSS international summer school which the MGA co-sponsored.

## Programme

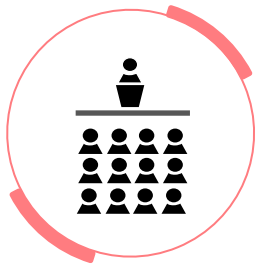
14:00 – 15:00      Coming soon





## PROGRAMME DETAILS

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### Closing Session



15:00-16:00, Wednesday 11<sup>th</sup> October 2017



Jasmine 1-3



Mr. Satoshi Kogure, Secretary-General of MGA  
Secretariat

### Overview

In this session, the MGA Secretariat will give a summary report of each of the sessions and conclude the conference.

In addition, the venue for next year's MGA Conference will be announced.

### Programme

15:00 – 16:00

Wrap up and Announcement of Next Year's Venue by MGA secretariat

Closing Remarks by:

Ms. Clara Yatini, Local Organizing Committee Chair

Prof. Teruyuki Kato, Univ. of Tokyo, Japan

# SPONSORSHIP PACKAGE PLAN

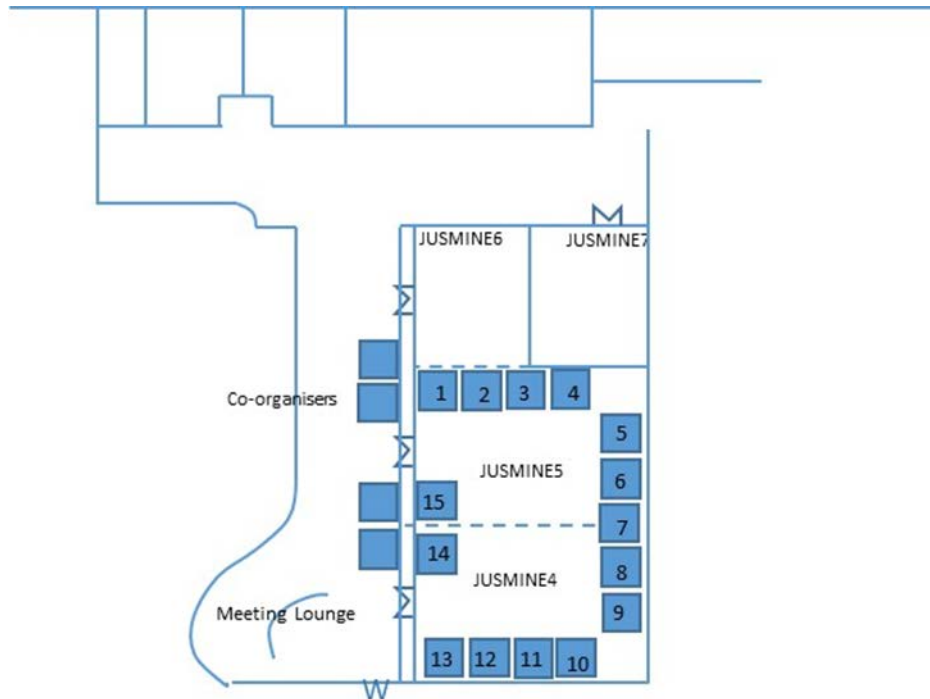


		Platinum	Gold	Silver
Fee	Base (Early-bird Registration by 25 <sup>th</sup> August)	5,000 USD (3,000 USD)	3,000 USD (1,500 USD)	1,000 USD (500 USD)
Publicity	Company Logo featured on the MGA website	Yes	Yes	Yes
	Company brochure inclusion in conference kit	Yes	Yes	No
	Company leaflet (A4) in programme (PDF)	Colour 1 page	No	No
	Video loop	30 secs	15 secs	No
	Booth size allocated on floor plan	Yes (2m x 2m) (Monitor equipped)	Yes (2 m x 2 m)	Yes (poster board and table only)
	Priority to select booth location	Yes	No	No
	Certificate of sponsorship	Yes	Yes	Yes

Platinum Sponsors have priority to select booth location on a first-come-first-served basis. Gold Sponsors' booths shall be assigned by the secretariat (no choice of booth location available to Gold sponsors).

# BOOTH DETAILS

## Floor Plan (tentative)



## Booth Design and Details (Photo of Booth, Other facilities for the booth)



Sample photo of the booth

Supply of booth shell with following components per booth:

- White panels with silver alum system frames
- Needle punch carpet flooring
- 1 unit new line information table
- 2 units Chairs
- 2 units fluorescent lamp
- 1 unit Convenience Outlet
- Company name on fascia board
- Main circuit breaker

# SPONSORSHIP APPLICATION FORM



**Early Bird Deadline: Friday 25<sup>th</sup> August 2017**

<b>Company / Organization Name</b>	
<b>Sponsorship Level</b>	<input type="checkbox"/> Platinum (5,000 USD; EB 3,000 USD) <input type="checkbox"/> Gold (3,000 USD; EB 1,500 USD) <input type="checkbox"/> Silver (1,000 USD; EB 500 USD)
<b>Requested Booth Location (For Platinum Sponsors only)</b>	(Please state the Booth number of your selection) No. ___
<b>Contact Person</b>	
<b>Contact Number (TEL)</b>	
<b>E-mail Address</b>	
<b>Application Procedure</b>	<ol style="list-style-type: none"><li>1. After we have received the application form, we will help you proceed with the sponsorship fee payment. Your reservation will be confirmed and you will receive an invoice for the reserved area after the payment procedure.</li><li>2. Please send the <b>application form</b> and <b>company logo</b> to MGA conference secretariat <b>via email</b> (<a href="mailto:secretariat@multignss.asia">secretariat@multignss.asia</a>)</li><li>3. If you register <b>by 25<sup>th</sup> August</b>, the <b>early-bird discount (EB rate)</b> is applied.</li></ol>

# APPLICATION FORM FOR ABSTRACTS OR PROCEEDINGS



Please send your information and abstract or proceedings to [secretariat@multignss.asia](mailto:secretariat@multignss.asia).

## Information of Presenter

Name	
Affiliation	
Department	
Job Title	
Biography (50 words)	

### 1. Presentation Abstract

Title of presentation	
Presentation Style	<input type="checkbox"/> Oral <input type="checkbox"/> Poster <input type="checkbox"/> Either
Paper Style	<input type="checkbox"/> Abstract (1 page) <input type="checkbox"/> Proceedings (maximum 4 pages)
Session	<p>Please check the session at which you wish to make a presentation.</p> <p><input type="checkbox"/> "Latest Trends in Multi-GNSS Technology and Research"</p> <p><input type="checkbox"/> "Industrial Developments of Multi-GNSS and their Applications"</p> <p><input type="checkbox"/> "Next Generation Multi-GNSS Resilient Solutions for Sustainable Development" (Those who wish to make a presentation at this session, please check one of the boxes below.)</p> <p><input type="checkbox"/> "Precise Positioning (PP)"</p> <p><input type="checkbox"/> "Intelligent Transport System (ITS)"</p> <p><input type="checkbox"/> "Disaster Mitigation and Management (DMM)"</p> <p><input type="checkbox"/> "Location Based Service (LBS)"</p> <p><input type="checkbox"/> "Others"</p>
Requests to the Secretariat	

# ABSTRACT STYLE SHEET



" Title "

Author A Full NAME\*, Author B Full NAME\*\*, and Author C Full NAME\*\*\*

*\*Department, Affiliation, Nationality, E-mail address of the corresponding author*

*\*\*Department, Affiliation, Nationality*

*\*\*\*Department, Affiliation, Nationality*

## **Abstract:**

Title of the abstract should be written with 12 pt Bold typeface. In title, capitalize all the words with 4 characters or longer. Author's family names should be written in capitals. Main body of the abstract must be single spaced, fully justified, and must use 12 pt Times New Roman font. There is no indentation at the beginning of each paragraph. There must be one empty line between successive paragraphs.

Please underline the Corresponding Author's name and include the email address in the affiliation information below the author's names. If references are included, they must be indicated in the text in brackets [#] and listed at the bottom following the format indicated. Authors are encouraged to supply web URLs that link to any additional information relevant to the paper.

Abstracts will be printed out in a black/white mode and distributed to all the participants. At the meeting, you will receive a programme book, in which all the presentations and authors are listed with presentation schedule.

The entire abstract is limited to one page and you can insert graphics (in JPEG or PNG format) and tables. Abstracts must be submitted as WORD (.doc or .docx) files not exceeding 5MB in size. Additionally, please name your file according to the following convention: lastname\_firstname\_abstractacronym.doc

## **Keywords (3-5 words):**

keyword1, keyword2, keyword3, keyword4, keyword5

## **References:**

[#] A. A. Author of article. "Title of article," *Title of Journal*, vol. #, no. #, pp. page number/s, Month year. (Journal Article)



## Paper Title\* (use style: *paper title*)

Subtitle as needed (*paper subtitle*)

Authors Name/s per 1st Affiliation (*Author*)

line 1 (of *Affiliation*): dept. name of organization

line 2-name of organization, acronyms acceptable

line 3-City, Country

line 4-e-mail address if desired

Authors Name/s per 2nd Affiliation (*Author*)

line 1 (of *Affiliation*): dept. name of organization

line 2-name of organization, acronyms acceptable

line 3-City, Country

line 4-e-mail address if desired

**Abstract**—This electronic document is a “live” template and already defines the components of your paper [title, text, heads, etc.] in its style sheet. **\*CRITICAL: Do Not Use Symbols, Special Characters, or Math in Paper Title or Abstract.** (*Abstract*)

**Keywords**—*component; formatting; style; styling; insert (key words)*

### I. Introduction (*Heading 1*)

This template, modified in MS Word 2007 and saved as a “Word 97-2003 Document” for the PC, provides authors with most of the formatting specifications needed for preparing electronic versions of their papers. All standard paper components have been specified for three reasons: (1) ease of use when formatting individual papers, (2) automatic compliance to electronic requirements that facilitate the concurrent or later production of electronic products, and (3) conformity of style throughout the conference proceedings. Margins, column widths, line spacing, and type styles are built-in; examples of the type styles are provided throughout this document and are identified in italic type, within parentheses, following the example. Some components, such as multi-leveled equations, graphics, and tables are not prescribed, although the various table text styles are provided. The formatter will need to create these components, incorporating the applicable criteria that follow.

### II. Ease of Use

#### A. *Selecting a Template (Heading 2)*

First, confirm that you have the correct template for your paper size. This template has been tailored for output on the A4 paper size..

#### B. *Maintaining the Integrity of the Specifications*

The template is used to format your paper and style the text. All margins, column widths, line spaces, and text fonts are prescribed; please do not alter them. You may note peculiarities. For example, the head margin in this template measures proportionately more than is customary. This measurement and others are deliberate, using specifications that anticipate your paper as one part of the entire proceedings, and not as an

independent document. Please do not revise any of the current designations.

### III. Prepare Your Paper Before Styling

Before you begin to format your paper, first write and save the content as a separate text file. Keep your text and graphic files separate until after the text has been formatted and styled. Do not use hard tabs, and limit use of hard returns to only one return at the end of a paragraph. Do not add any kind of pagination anywhere in the paper. Do not number text heads-the template will do that for you.

Finally, complete content and organizational editing before formatting. Please take note of the following items when proofreading spelling and grammar:

#### A. *Abbreviations and Acronyms*

Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, sc, dc, and rms do not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable.

#### B. *Units*

- Use either SI (MKS) or CGS as primary units. (SI units are encouraged.) English units may be used as secondary units (in parentheses). An exception would be the use of English units as identifiers in trade, such as “3.5-inch disk drive.”
- Avoid combining SI and CGS units, such as current in amperes and magnetic field in oersteds. This often leads to confusion because equations do not balance dimensionally. If you must use mixed units, clearly state the units for each quantity that you use in an equation.
- Do not mix complete spellings and abbreviations of units: “Wb/m<sup>2</sup>” or “webers per square meter,” not “webers/m<sup>2</sup>.” Spell units when they appear in text: “...a few henries,” not “...a few H.”
- Use a zero before decimal points: “0.25,” not “.25.” Use “cm<sup>3</sup>,” not “cc.” (*bullet list*)

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Identify applicable sponsor/s here. If no sponsors, delete this text box (*sponsors*).



# PROCEEDINGS STYLE SHEET

## C. Equations

The equations are an exception to the prescribed specifications of this template. You will need to determine whether or not your equation should be typed using either the Times New Roman or the Symbol font (please no other font). To create multileveled equations, it may be necessary to treat the equation as a graphic and insert it into the text after your paper is styled.

Number equations consecutively. Equation numbers, within parentheses, are to position flush right, as in (1), using a right tab stop. To make your equations more compact, you may use the solidus (/), the exp function, or appropriate exponents. Italicize Roman symbols for quantities and variables, but not Greek symbols. Use a long dash rather than a hyphen for a minus sign. Punctuate equations with commas or periods when they are part of a sentence, as in

$$a + b = \gamma \quad (1)$$
$$\alpha + \beta = \chi. \quad (1)$$

Note that the equation is centered using a center tab stop. Be sure that the symbols in your equation have been defined before or immediately following the equation. Use “(1),” not “Eq. (1)” or “equation (1),” except at the beginning of a sentence: “Equation (1) is ...”

## D. Some Common Mistakes

- The word “data” is plural, not singular.
- The subscript for the permeability of vacuum  $\mu_0$ , and other common scientific constants, is zero with subscript formatting, not a lowercase letter “o.”
- In American English, commas, semi-/colons, periods, question and exclamation marks are located within quotation marks only when a complete thought or name is cited, such as a title or full quotation. When quotation marks are used, instead of a bold or italic typeface, to highlight a word or phrase, punctuation should appear outside of the quotation marks. A parenthetical phrase or statement at the end of a sentence is punctuated outside of the closing parenthesis (like this). (A parenthetical sentence is punctuated within the parentheses.)
- A graph within a graph is an “inset,” not an “insert.” The word alternatively is preferred to the word “alternately” (unless you really mean something that alternates).
- Do not use the word “essentially” to mean “approximately” or “effectively.”
- In your paper title, if the words “that uses” can accurately replace the word using, capitalize the “u”; if not, keep using lower-cased.
- Be aware of the different meanings of the homophones “affect” and “effect,” “complement” and “compliment,” “discreet” and “discrete,” “principal” and “principle.”
- Do not confuse “imply” and “infer.”

- The prefix “non” is not a word; it should be joined to the word it modifies, usually without a hyphen.
- There is no period after the “et” in the Latin abbreviation “et al.”
- The abbreviation “i.e.” means “that is,” and the abbreviation “e.g.” means “for example.”

An excellent style manual for science writers is [7].

## IV. Using the Template

After the text edit has been completed, the paper is ready for the template. Duplicate the template file by using the Save As command, and use the naming convention prescribed by your conference for the name of your paper. In this newly created file, highlight all of the contents and import your prepared text file. You are now ready to style your paper; use the scroll down window on the left of the MS Word Formatting toolbar.

### A. Authors and Affiliations

The template is designed so that author affiliations are not repeated each time for multiple authors of the same affiliation. Please keep your affiliations as succinct as possible (for example, do not differentiate among departments of the same organization). This template was designed for two affiliations.

1) *For author/s of only one affiliation (Heading 3):* To change the default, adjust the template as follows.

a) *Selection (Heading 4):* Highlight all author and affiliation lines.

b) *Change number of columns:* Select the Columns icon from the MS Word Standard toolbar and then select “1 Column” from the selection palette.

c) *Deletion:* Delete the author and affiliation lines for the second affiliation.

2) *For author/s of more than two affiliations:* To change the default, adjust the template as follows.

a) *Selection:* Highlight all author and affiliation lines.

b) *Change number of columns:* Select the “Columns” icon from the MS Word Standard toolbar and then select “1 Column” from the selection palette.

c) Highlight author and affiliation lines of affiliation 1 and copy this selection.

d) *Formatting:* Insert one hard return immediately after the last character of the last affiliation line. Then paste down the copy of affiliation 1. Repeat as necessary for each additional affiliation.

e) *Reassign number of columns:* Place your cursor to the right of the last character of the last affiliation line of an even numbered affiliation (e.g., if there are five affiliations, place your cursor at end of fourth affiliation). Drag the cursor up to highlight all of the above author and affiliation lines. Go to Column icon and select “2 Columns”. If you have an odd number of affiliations, the final affiliation will be centered on the page; all previous will be in two columns.





# PROCEEDINGS STYLE SHEET

## B. Identify the Headings

Headings, or heads, are organizational devices that guide the reader through your paper. There are two types: component heads and text heads.

Component heads identify the different components of your paper and are not typically subordinate to each other. Examples include ACKNOWLEDGMENTS and REFERENCES, and for these, the correct style to use is "Heading 5." Use "figure caption" for your Figure captions, and "table head" for your table title. Run-in heads, such as "Abstract," will require you to apply a style (in this case, italic) in addition to the style provided by the drop down menu to differentiate the head from the text.

Text heads organize the topics on a relational, hierarchical basis. For example, the paper title is the primary text head because all subsequent material relates and elaborates on this one topic. If there are two or more sub-topics, the next level head (uppercase Roman numerals) should be used and, conversely, if there are not at least two sub-topics, then no subheads should be introduced. Styles named "Heading 1," "Heading 2," "Heading 3," and "Heading 4" are prescribed.

## C. Figures and Tables

1) *Positioning Figures and Tables: Place figures and tables at the top and bottom of columns. Avoid placing them in the middle of columns. Large figures and tables may span across both columns. Figure captions should be below the figures; table heads should appear above the tables. Insert figures and tables after they are cited in the text. Use the abbreviation "Fig. 1," even at the beginning of a sentence.*

TABLE I. TABLE STYLES

Table Head	Table Column Head		
	Table column subhead	Subhead	Subhead
copy	More table copy <sup>a</sup>		

<sup>a</sup> Sample of a Table footnote. (Table footnote)

We suggest that you use a text box to insert a graphic (which is ideally a 300 dpi resolution TIFF or EPS file with all fonts embedded) because this method is somewhat more stable than directly inserting a picture.

To have non-visible rules on your frame, use the MSWord "Format" pull-down menu, select Text Box > Colors and Lines to choose No Fill and No Line.

b.

Fig. 1. Example of a figure caption. (figure caption)

Figure Labels: Use 8 point Times New Roman for Figure labels. Use words rather than symbols or abbreviations when writing Figure axis labels to avoid confusing the reader. As an example, write the quantity "Magnetization," or "Magnetization, M," not just "M." If including units in the label, present them within parentheses. Do not label axes only with units. In the example, write "Magnetization (A/m)" or "Magnetization (A ( m(1)," not just "A/m." Do not label axes with a ratio of

quantities and units. For example, write "Temperature (K)," not "Temperature/K."

## ACKNOWLEDGMENT (Heading 5)

The preferred spelling of the word "acknowledgment" in America is without an "e" after the "g." Avoid the stilted expression "one of us (R. B. G.) thanks ...". Instead, try "R. B. G. thanks...". Put sponsor acknowledgments in the unnumbered footnote on the first page.

## REFERENCES

The template will number citations consecutively within brackets [1]. The sentence punctuation follows the bracket [2]. Refer simply to the reference number, as in [3]—do not use "Ref. [3]" or "reference [3]" except at the beginning of a sentence: "Reference [3] was the first ..."

Number footnotes separately in superscripts. Place the actual footnote at the bottom of the column in which it was cited. Do not put footnotes in the reference list. Use letters for table footnotes.

Unless there are six authors or more give all authors' names; do not use "et al.". Papers that have not been published, even if they have been submitted for publication, should be cited as "unpublished" [4]. Papers that have been accepted for publication should be cited as "in press" [5]. Capitalize only the first word in a paper title, except for proper nouns and element symbols.

For papers published in translation journals, please give the English citation first, followed by the original foreign-language citation [6].

- [1] G. Eason, B. Noble, and I.N. Sneddon, "On certain integrals of Lipschitz-Hankel type involving products of Bessel functions," Phil. Trans. Roy. Soc. London, vol. A247, pp. 529-551, April 1955. (references)
- [2] J. Clerk Maxwell, A Treatise on Electricity and Magnetism, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp.68-73.
- [3] I.S. Jacobs and C.P. Bean, "Fine particles, thin films and exchange anisotropy," in Magnetism, vol. III, G.T. Rado and H. Suhl, Eds. New York: Academic, 1963, pp. 271-350.
- [4] K. Elissa, "Title of paper if known," unpublished.
- [5] R. Nicole, "Title of paper with only first word capitalized," J. Name Stand. Abbrev., in press.
- [6] Y. Yorozu, M. Hirano, K. Oka, and Y. Tagawa, "Electron spectroscopy studies on magneto-optical media and plastic substrate interface," IEEE Transl. J. Magn. Japan, vol. 2, pp. 740-741, August 1987 [Digests 9th Annual Conf. Magnetism Japan, p. 301, 1982].
- [7] M. Young, The Technical Writer's Handbook. Mill Valley, CA: University Science, 1989.