# The Fourth International School on "THE DETERMINATION AND USE OF THE GEOID"

## Johor Bahru, Malaysia 21- 25 February 2000

**Introduction**

In the effort of continuing and spreading the technical culture for the determination and use of the geoid, the International Association of Geodesy (IAG), through its International Geoid Service (IGeS), has organised the IGeS Geoid School in Johor Bahru, Malaysia on 21 – 25 February 2000.

Department of Survey and Mapping Malaysia (DSMM) was initially invited to be the local organiser in the late September 1998. The date for the school was changed twice due to some organisation and budgetary problems.

The general purpose of this school was to prepare new graduate students, young scientists or employees of national agencies and services or industry staff, to use and, when necessary, to compute gravimetric geoids for the many scientific and technical applications in geodesy, primarily in transforming ellipsoidal (GPS) heights into orthometric heights.

The school was structured in a way to be self-contained for any participant at graduate level with basic knowledge of geodesy.

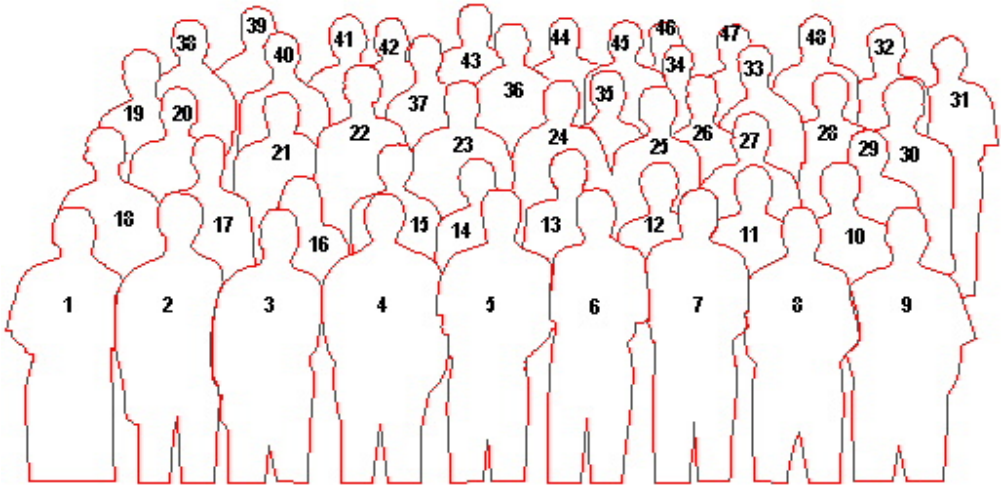
**The courses included:**

| | |
|---|---|
| ***Monday:*** | A general introduction to physical geodesy, geoid computation and collocation theory by Fernando Sansò<br><br>Introduction and explanation on the role and present activities of BGI by Jean Pierre Barriot . In conjunction, a South East Asia Geodetic Committee Meeting was held in the afternoon to discuss various issues related to IAG. |
| ***Tuesday:*** | The computation and use of global models of high and ultra-high degree, by Riccardo Barzaghi |
| ***Wednesday:*** | Optimisation of Stokes' Integral in Geoid Computations by A.H.W. Kearsley |
| ***Thursday:*** | The terrain and residual terrain correction,<br>by Rene Forsberg |
| ***Friday:*** | Fast Fourier techniques to perform the computation of the main formulas in physical geodesy,<br>by Micheal Sideris |

## Participants

We were contacted by 65 people from the first announcement to the end, and finally we've got a final number of 41 students who came from Australia, Chile, China, Ethiopia, France, Hong Kong, Indonesia, Malaysia, Nepal, Singapore, Sweden, Republic of Maldives and USA.successfully attended the school. Old and new Lecture Notes have been provided and IGeS software as well as numerical exercises have been made available to the students. All participants were provided with software material in a CD which was distributed to each participant under a contract condition that it would not be used for commercial purposes.

Lecturers, participants and organiser to the school



## List of Participants, Lecturers and Organiser

| | Name | Country of Origin |
|---|---|---|
| 1. | Kamaludin Hj Omar | Malaysia |
| 2. | Azhari Mohamed | Malaysia |
| 3. | Samad Hj Abu | Malaysia |
| 4. | Micheal Sideris | Canada |
| 5. | Fernando Sanso | Italy |
| 6. | Riccardo Barzaghi | Italy |
| 7. | Rene Forsberg | Denmark |
| 8. | A.H.W.Kearsley | Australia |
| 9. | Sharum Ses | Malaysia |
| 10. | David Chang Leng Hua | Malaysia |
| 11. | Sobar Sutisna | Indonesia |
| 12. | Kamaludin Hj Talib | Malaysia |
| 13. | Edwin Hendrayana | Indonesia |
| 14. | Endella Ehin | Malaysia |
| 15. | Dadan Ramdani | Indonesia |
| 16. | Sarah Chan Sim Ling | Hong Kong |
| 17. | Toya Nath Baral | Nepal |
| 18. | Kamaruzaman Wahid | Malaysia |
| 19. | Alexander Chong | Malaysia |
| 20. | Khor Soong Wei | Malaysia |
| 21. | Ung Cheng Pee | Malaysia |
| 22. | Chen Kah Eng | Malaysia |
| 23. | Mohamed Nur JP Vella | Australia |
| 24. | Jean Pierre Barriot | France |
| 25. | Wong Kam Fai | Malaysia |
| 26. | Mok Ly Yng | Singapore |
| 27. | Hermis Mogindol | Malaysia |
| 28. | Wong Yew Kin | Malaysia |
| 29. | Mohd Nor Kamarudin | Malaysia |
| 30. | Mohd Halmi Kamaruddin | Malaysia |
| 31. | Nor Azmawi Ab Rahman | Malaysia |
| 32. | Li Fei | China |
| 33. | Mikael Lilje | Sweden |
| 34. | Ahmed Nashid | Republic of Maldives |
| 35. | Mohd Hairul Said | Malaysia |
| 36. | Haryono Joyosentono | Indonesia |
| 37. | Andrew Phung Voon Seng | Malaysia |
| 38. | Robert Cheng | Malaysia |
| 39. | Gary Johnston | Australia |
| 40. | Yap Nam Seen | Malaysia |
| 41. | Koh Lam Seng | Malaysia |
| 42. | So Sun Sing | Malaysia |
| 43. | Daniel Roman | U.S.A |
| 44. | Hassan Hashim Fashir | Sudan |
| 45. | Bong Sen Kui | Malaysia |
| 46. | David Sproule | Australia |
| 47. | Taib Belal | Malaysia |
| 48. | Oscar Cifuentes | Chile |
| | **Name** | **Country of Origin** |

**IGeS Geoid School Secretariat**

***KUALA LUMPUR***

Department of Survey and Mapping Malaysia
8th Floor, Bangunan Ukur,
Jalan Semarak,
50578 Kuala Lumpur
Malaysia
Tel : 03-2925311 Ext 2685
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***JOHOR BAHRU***

IGeS Geoid School
Secretariat
Baiduri Room, B2
Puteri Pan Pacific Hotel
Kotaraya,
Johor Bahru, Johor
Malaysia
Tel : 07-2233333
Fax : 07-2233522

**IGeS Geoid School Venue**

Permata 3 Ballroom, B2
Puteri Pan Pacific Hotel
Kotaraya,
Johor Bahru,Malaysia

**Coordinators**

Dr. Abdul Majid bin Abd. Kadir

Mr. Samad bin Hj. Abu

**Conveners**

Dr. Abdul Majid bin Abd. Kadir

Dr. Sharum bin Ses

Dr. Mohd. Nor bin Kamaruddin

Mr. Kamaludin bin Hj. Omar

Dr. Hassan bin Hashim Fashir

**Secretariat**

Mr. David Chang Leng Hua

**Course Schedule**

All lectures was held at the Permata 3 Ballroom on the Basement 2 Level of Puteri Pan Pacific Hotel

**20 February 2000 (Sunday)**

| | |
|---|---|
| 1000 – 1700 | Participants check-in into respective Accommodation |
| 1400 – 2200 | Course Registration |

**21 February 2000 (Monday)**

| | | |
|---|---|---|
| 0800 | Course Registration | |
| 0830 | Opening Ceremony | |
| 0930 | Tea Break | |
| 1000 | Course commences | |
| | Lecture 1 – General Theory | Dr Fernando Sanso |
| | Lecture 2 – Collocation Theory | Dr Fernando Sanso |
| 1200 | Lunch | |
| 1400 | Lecture 3 – Continue | Dr Fernando Sanso |
| 1530 | Tea Break | |
| 1700 | Day Ends | |
| 1730 | South East Asia Geodetic Committee Meeting | |
| 1930 | Dinner by Local Organising Committee | |

**22 February 2000 (Tuesday)**

| | |
|---|---|
| 0830 | Lecture 3 – Global Models Dr. Riccardo Barzaghi |
| 1000 | Tea Break |
| 1015 | Lecture 3 (Continues) |
| 1200 | Lunch |
| 1400 | Exercises Dr. Riccardo Barzaghi (with DSMM and UTM) |
| 1530 | Tea Break |
| 1545 | Exercises (Continue) |
| 1700 | Day Ends |

**23 February 2000 (Wednesday)**

| | |
|---|---|
| 0830 | Lecture 4 – The use of Optimized Stokes's Formula<br>Dr. A.H.W Kearsley |
| 1000 | Tea Break |
| 1015 | Lecture 4 (Continues) |
| 1200 | Lunch |
| 1400 | Exercises Dr. A.H.W Kearsley (with DSMM and UTM) |
| 1530 | Tea Break |
| 1545 | Exercises (Continue) |
| 1700 | Day Ends |

**24 February 2000 (Thursday)**

| | |
|---|---|
| 0830 | Lecture 5 – Terrain Correction Theory<br>Dr. Rene Forsberg |
| 1000 | Tea Break |
| 1015 | Lecture 5 (Continues) |
| 1200 | Lunch |
| 1430 | Exercises Dr. Rene Forsberg (with DSMM and UTM) |
| 1530 | Tea Break |
| 1546 | Exercises (Continue) |
| 1700 | Day Ends |

**25 February 2000 (Friday)**

| | | |
|---|---|---|
| 0830 | Lecture 6 – The FFT Approach to the Geoid Determination<br>Dr. Michael Sideris | |
| 1000 | Tea Break | |
| 1015 | Lecture 6 (Continues) | |
| 1200 | Lunch | |
| 1400 | Exercises | Dr. Michael Sideris (with DSMM and UTM) |
| 1600 | Closing Ceremony | |
| 1745 | Course Ends | |

## Registration Fees

The registration fee was fixed as follow:

| **Participant** | **Before 15 Nov 1999** | **Before 31 Dec 1999** |
|---|---|---|
| Overseas | US 230.00 | US 270.00 |
| Malaysian | RM874.00 | RM1026.00 |

The fee covered all school expenses including lecture notes and software CD. only for research use by universities and government agencies.

## Facilities of the School

- Overhead projector
- Screens for projection
- White board
- Fax and telephone
- Photocopies
- Coffee break (twice a day)
- Lunch
- PCs on LAN
- One UNIX server with FORTRAN compiler
- 22 PCs all networked together and with the server and with Xwindows software.
- All computers should have ETHERNET connections for software transfer.
- Surfer graphical capabilities for displaying geoid and gravity anomaly maps.

- RAM requirements: 64MB
- Hard disk space : Min One (1) GB.
- Notepad and pencil
- Map indicating the main places of interest near the School (banks, restaurants, drugstores, photo studios, transportation)
- Seminar Badge
- Seminar Bag
- CD for each student including all Geoid School software.
- Printers

**ADVERTISING**

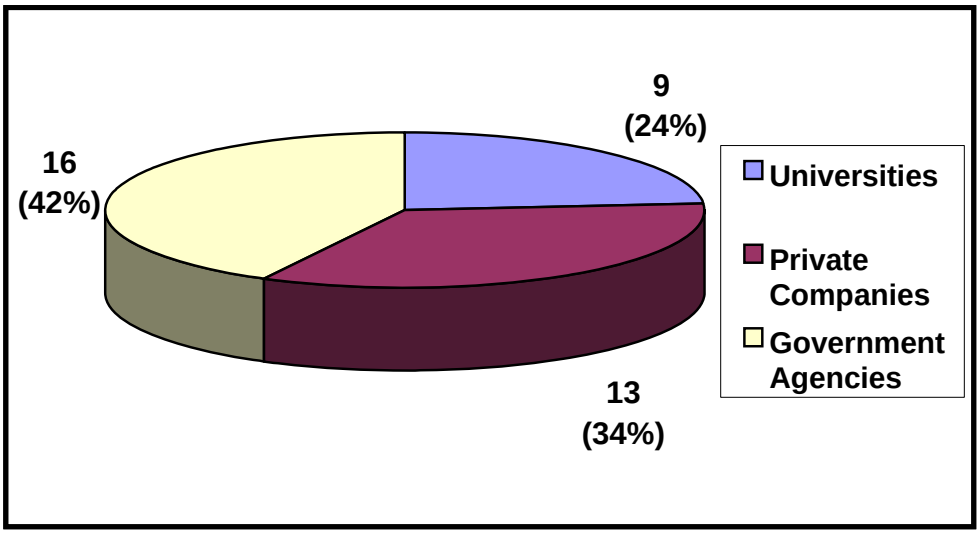
IGeS Bulletin, E-mail, DSMM and IGeS web page.

**INVITATION AND PLANNING**

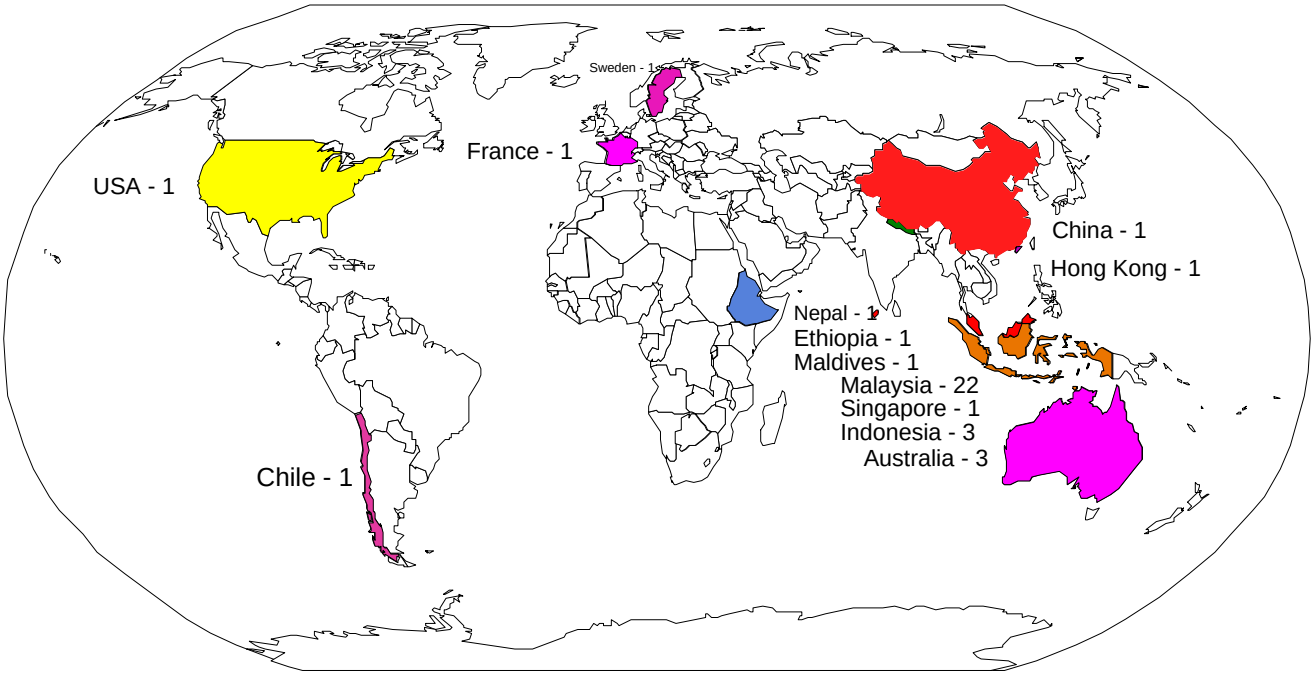
The first circular and seminar brochure were sent to the following groups:

- IAG web page;
- PCGIAP (Permanent Committee on GIS Infrastructure for Asia and the Pacific) representatives and many other research institutions, universities and every group that have used the services and products provided by DSMM.
- Malaysian Private Surveyors Company;

**Main activity of the participants**



**Distribution of the students by country**




**Opening Dinner**

The opening dinner was given by the Local Organising Committee for the participants and the lecturers. It was held at the Poolside Restaurant of the Puteri Pan Pacific Hotel with a buffet Barbeque menu. A cultural show was presented to allow the participants, especially from the overseas to acquainted with the local traditions. In fact some were left with quite an unusual memories.

**Transportation**

Since the school was conducted at the hotel where all participants stayed, transportation was not necessary.

**Suggestions**

- The school should cater for various level of users so as not to compromise the standard and also would allow the beginners to follow much easily.

- A bus tour of the city should be included in the seminar to allow the participants to get to know of the local attractions and cultures.
- The duration of the school should be extended so as to allow for a more detailed lectures and comprehensive practicals on various topics.
- A topic on GPS heighting should be included on future course.
- More tutors should be provided in the practicals on software usage