

Introduction of Taiwan Society for Mass Spectrometry

Jentaie Shiea

President of the Taiwan Society for Mass Spectrometry

Received May 18, 2011; Revised May 18, 2011; Accepted May 18, 2011

First published on the web June 15, 2011; DOI: 10.5478/MSL.2011.2.2.029

History : Mass spectrometers today are among the most important and widely used analytic instruments. In principle can be used to detect the structure, composition, and characteristics of any given molecule. Mass spectrometers are used in physics, chemistry, biology, geology, environmental testing, quality control, diagnosis, forensic, and drug testing. Recently, MS approaches have played an important role in Taiwan, as evidenced by upsurge of researches and applications, such as environmental monitoring, medical analysis, biochemical development (genomics, metabolomics, and proteomics), and instrumentation, related to mass spectrometry. The Taiwan Society for Mass Spectrometry (TSMS) was formed in 2003 and dedicated to the promotion of the knowledge related to mass spectrometry and allied topics.

Aims of TSMS : The aims of the TSMS are to advance the science and practice of mass spectrometry worldwide by the promotion and dissemination of knowledge. To this end, the specific aims of the TSMS include:

- to organize annual conference, symposiums, and workshops in diverse areas in the field of mass spectrometry;
- to organize training courses to improve education in the field of mass spectrometry;
- to do all things that are, directly or indirectly, generally incidental to, or conducive to the attainment of these objects.

Organization : The active members of TSMS are around 500 scientists. They comprise academics or professionals from governmental institutions, universities and industry (full members) and full-time graduate students in academic institutions (student members). Every three year, the TSMS members elect 25 board members. Five acting board members will be subsequently elected by the board members. The president of the society will be elected from the acting members. Professor Guor-Rong Her from National Taiwan University, Taipei was elected as the first president of the society (2003–2005). Professor Maw-Rong Lee from National Chung Hsing University, Taichung was elected as the second

president (2006–2008). Professor Jentaie Shiea from National Sun Yat-sen University, Kaohsiung was elected as the third and current president of TSMS (2009–2011). The president and board members are responsible for planning, organizing, and promoting the activities of the society.

Research highlights of TSMS : Research in Taiwan revolves around mass spectrometry with a special focus on new analytical methods, techniques, interfaces, instrumentation, materials, and applications. Scientists and researchers commit themselves to develop novel topics of mass spectrometry and the research highlights mainly include:

- developing new methods for gas chromatography mass spectrometry (GC/MS) and liquid chromatography mass spectrometry (LC/MS) to improve their analytical efficiency;
- developing new sample pretreatment methods prior to mass spectrometric analysis by using solid-phase extraction (SPE) or solid-phase microextraction (SPME) and others;
- developing interfaces to efficiently combine capillary electrophoresis (CE), gas chromatography (GC), liquid chromatography (LC) with mass spectrometry;
- developing various ambient ionization sources based on electrospray ionization (ESI) and atmospheric pressure chemical ionization (APCI) for rapid, real time and high throughput analysis;
- developing new mass spectrometric instruments including biological and nanoparticle mass spectrometry, mini-gas chromatography/mass spectrometry, dual-polarity mass spectrometry and ion mobility mass spectrometry;
- developing new MALDI matrix such as functionalized nanomaterials and quantum dots;
- application of modern mass spectrometry in proteomics, metabolomics, pharmaceuticals, traditional Chinese medicine, drug abuse, food safety, forensic science, environmental or material analysis;

Activities of the society : The TSMS organizes events for both society members and nonmember-scientists, such as annual conference, symposiums, workshops, training courses that are relevant to mass spectrometry and other activities at the initiation or request by the societies. Joint events may be organized with universities, societies, and relevant corporations.

*Reprint requests to Dr. Jentaie Shiea
E-mail: jetea@fac.nsysu.edu.tw

The annual conference is held in various cities in June or July each year. Four workshops with different and novel topics are held each year since 2009. Each year, the TSMS offers three training courses in Northern, Central, and Southern Taiwan to the members and publics, which introduce mass spectrometric principles, operations, and its applications both in basic and in advanced courses for new juniors or seniors of mass spectrometry.

Annual Conference : The annual conference of the TSMS takes place in different cities in Taiwan. Usually more than 400 experts from academics, industrials and governmental institutions attend the conference. Nearly 200 papers including orals and posters are presented. New developments in mass spectrometry are always discussed during the period of conference. Moreover, in order to improve the research quality of mass spectrometric technologies in Taiwan and to assist the researchers to have more connections to the world, TSMS have invited the scholars from abroad (such as United States, Canada, Hong Kong, Singapore, Japan, Germany, China, Korea, and Switzerland) to join with TSMS conferences as speakers. The followings show the invited speakers and topic of plenary lectures since 2004:

- *Annual conference in 2004, TAIPEI*
Mr. Koichi Tanaka, (Shimadzu Corporation, Japan; Nobel Laureate in Chemistry) **Topic:** The Origin of Macromolecule Ionization by Laser Irradiation
- *Annual conference in 2005, TAICHUNG*
Dr. Zeper Abliz, (Chinese Academy of Medical Sciences and Peking Union Medical College, China) **Topic:** Study on the Mass Spectrometric Method and Its Application in Molecular Recognition
- *Annual conference in 2006, KAOHSIUNG*
Prof. Maw-Kuen Wu, (Institute of Physics, Academia Sinica, Taiwan; Academician) **Topic:** Observation of Metal-Insulator Transition in Superconducting $\text{Li}(\text{Ti}_{2-x}\text{V}_x)\text{O}_4$
Prof. Yuan-Tsong Chen, (Institute of Biomedicine, Academia Sinica, Taiwan; Academician) **Topic:** Genetic Susceptibility to Serve Adverse Drug Reactions: Perspective for Future Medicine
- *Annual conference in 2007, TAINAN*
Prof. Kenzo Hiraoka, (University of Yamanashi, Japan; President of The Mass Spectrometry Society of Japan) **Topic:** Recent Development in Spray and Desorption Ionization
Dr. Jong Shin Yoo, (Korea Basic Science Institute, Korea; President of Korean Society of Mass Spectrometry) **Topic:** Relative Quantitation of Proteins with Isotope Tagged Technique in Mass Spectrometry
Prof. Yoshinao Wada, (Osaka University, Japan; President of The Mass Spectrometry Society of Japan) **Topic:** MS of Glycopeptides for Glycoproteomics
Dr. Detlef Gunther, (ETH Zurich, Switzerland) **Topic:** New Insights into Direct Solid Sampling Using Laser Ablation Inductively Coupled Plasma Mass Spectrometry-

Fundamentals and Applications

- *Annual conference in 2008, TAIPEI*
Prof. Da Fang Zhong, (Shanghai Institute of Materia Medica, Chinese Academy of Sciences, China)
Prof. Zong Wang, (Mount Sinai School of Medicine, USA; President of Chinese American Society for Mass Spectrometry) **Topic:** Exploration of Cellular Trafficking by Mass Spectrometry
- *Annual conference in 2009, TAICHUNG*
Prof. Yuan-Tseh Lee, (Institute of Atomic and Molecular Sciences, Academia Sinica, Taiwan; Nobel Laureate in Chemistry) **Topic:** Recent Investigations on MALDI
Prof. Alan G. Marshall, (National High Magnetic Field Laboratory, Florida State University, USA) **Topic:** Prospects and Needs for Higher Mass Spectral Resolution
- *Annual conference in 2010, KAOHSIUNG*
Prof. Chi-Huey Wong, (Academia Sinica, Taiwan; Academician and Chief) **Topic:** Post-Translational Glycosylation: Challenges and Opportunities
Prof. Yuan-Chuan Lee, (Johns Hopkins University, USA; Academician) **Topic:** The MS in My Life: A Reflection
- *Annual conference in 2011, TAIPEI*
The 2011 Annual TSMS Conference will be held in Academia Sinica, Taipei, July 10-12. Prof. David Clemmer, (Indiana University, USA) will give a lecture about Ion Mobility Mass Spectrometry and Dr. Alexander MacLennan (Thermo Scientific Corp.) will share the topic about Orbitrap Mass Spectrometry.

Training Courses : The training courses are held in different cities such as Taipei, Taichung, and Kaohsiung City each year. The basic courses are suitable for new juniors of mass spectrometry and the advance courses are helpful for senior users. The main subjects of the training courses from 2007 to 2010 are as below:

- *2007 TSMS Training Course—Mass Spectrometry and Molecules*
Course: Ionization Methods, Analyzers, Principle of Qualitative and Quantitative analysis and Applications.
- *2008 Training Course—Fundamental of Mass Spectrometry*
Course I : Principle of Mass Spectrometry, Spectra Analysis and Ionization Methods
Course II : Principle of MS Analyzers and Introduction of Tandem MS
- *2009 Training Course—Recent Development and Applications of Mass Spectrometry*
Course : Ionization Methods, MS Analyzers, Chip-LC-MS, ICP-MS;
- *2010 Training Course—Recent Development and Applications of Mass Spectrometry*
Course I : Introduction and Principle of Mass Spectrometry
Course II : Applications of Mass Spectrometry

Workshop : Since 2009, TSMS has organized the workshops with different novel topics of mass spectrometry. The primary

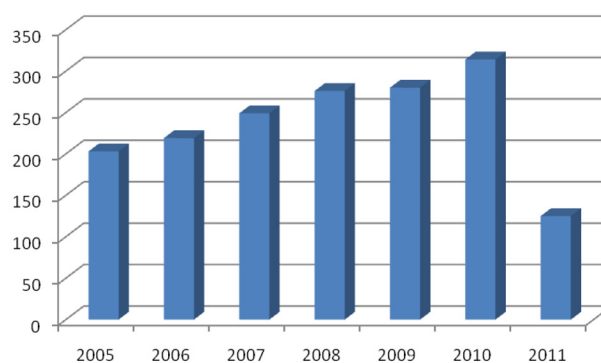
aim to have the workshop is to provide students, researchers and scientists from different areas of mass spectrometry with an interdisciplinary forum for a better understanding of basic principle and applications of mass spectrometry. It will focus on mass spectrometry insights into proteomics, metabolomics, analytical chemistry, forensic studies, quantitative analysis, and span a wide area of applications. The workshop formats mainly include oral presentations and encourage informal discussion among conferees. We hope that the workshop will promote the communication and cooperation of scientists from different fields of Mass Spectrometry. Until now, we have organized several workshops with various topics as following:

- *2009 Winter Workshop* (225 participants, National Cheng Kung University, Tainan), **Topic:** The Development and Principle of Mass Spectrometry in Quantitative Proteomic Analysis
- *2010 Spring Workshop* (83 participants, National Dong Hwa University, Hualien), **Topic:** Characterization of Microorganism and Application of Clinical Medicine
- *2010 Summer Workshop* (153 participants, National Chiao Tung University, Hsinchu), **Topic:** Nanomaterials and Mass Spectrometric Method
- *2010 Fall Workshop* (95 participants, Institute of Nuclear Energy Research, Taoyuan), **Topic:** Mass Spectrometry for Pharmaceuticals
- *2010 Winter Workshop* (180 participants, Biotechnology Research Center, Academic Sinica, Taipei), **Topic:** Application and New Development on Metabolomics
- *2011 Spring Workshop* (103 participants, National Chung Chang University, Chiayi), **Topic:** Mass Spectrometry and Toxicology

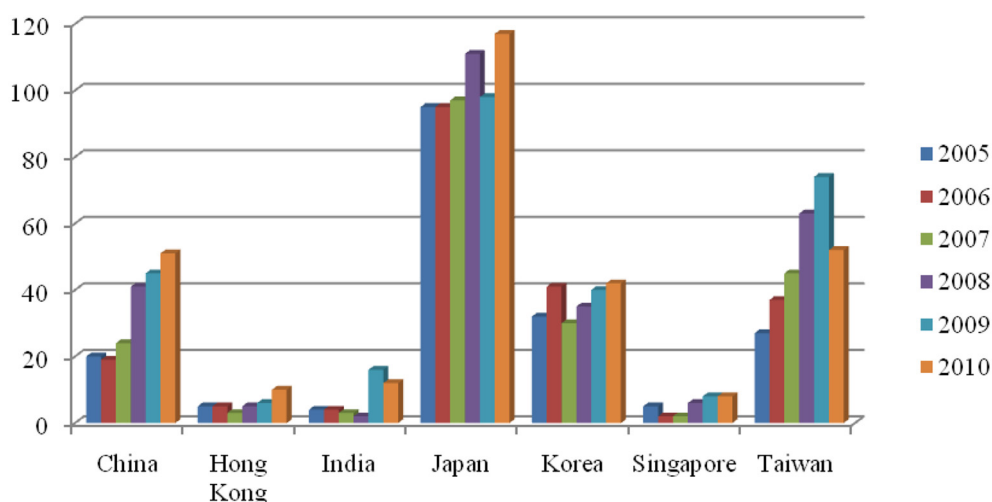
Award : In 2010, TSMS created and launched Outstanding Research Award to encourage talented young (below age of 45) and senior MS researchers in Taiwan. The Award

recognizes the achievements of outstanding young and senior investigators in the field of mass spectrometry. The candidates of the award can be nominated by two TSMS full members or by the members of the Award Committee. The award recipients will be determined by the Award Committee and will receive a medal and USD 2000. Prof. Yu-Chie Chen (National Chiao-Tung University, Hsinchu) received 2010 Award for her research achievement on applying different nanomaterials on mass spectrometric analysis.

Publications : For the past seven years, the researchers and scientists in Taiwan have dedicated to work related to mass spectrometry in earnest. A large number of significant research papers concerning the developments of mass spectrometric techniques, methods, interfaces and applications of various fields, such as proteomics, metabolomics, forensic science, environmental or material analysis, and biomedical diagnosis reflect strong research energy in mass spectrometry in Taiwan.



A number of published papers related to mass spectrometry in Taiwan from Jan 2005 to May 2011 (ISI web of knowledge, Keywords: mass spectrometry & Taiwan)



The number of poster presentations in the annual ASMS conference from mass spectrometry societies in Asia - 2005 to 2010.

Participation in international conferences : The TSMS members have actively attended the international conferences such as annual conference for American Society for Mass Spectrometry (ASMS), International Mass Spectrometry (IMS) conference, and Asia and Oceanic Mass Spectrometry Conference (AOMSC). Every year, more than 80 TSMS

members attend the annual conference of ASMS, the largest mass spectrometry conference in the world. The graphic below shows the numbers of posters presented in the ASMS conference from several Asian countries during the period of 2005 to 2010.