



# SETC

## 2009

# 15th SMALL ENGINE TECHNOLOGY CONFERENCE

### SMALL ENGINE ERA

PURSUING A SOCIETY LESS DEPENDENT ON OIL

## PRELIMINARY PROGRAM

**November 3 - 5 2009**

**Convention & Exhibition Centre**

**Hotel Equatorial**

**Penang, Malaysia**



**SAE** International<sup>TM</sup>

 **MASAAM**

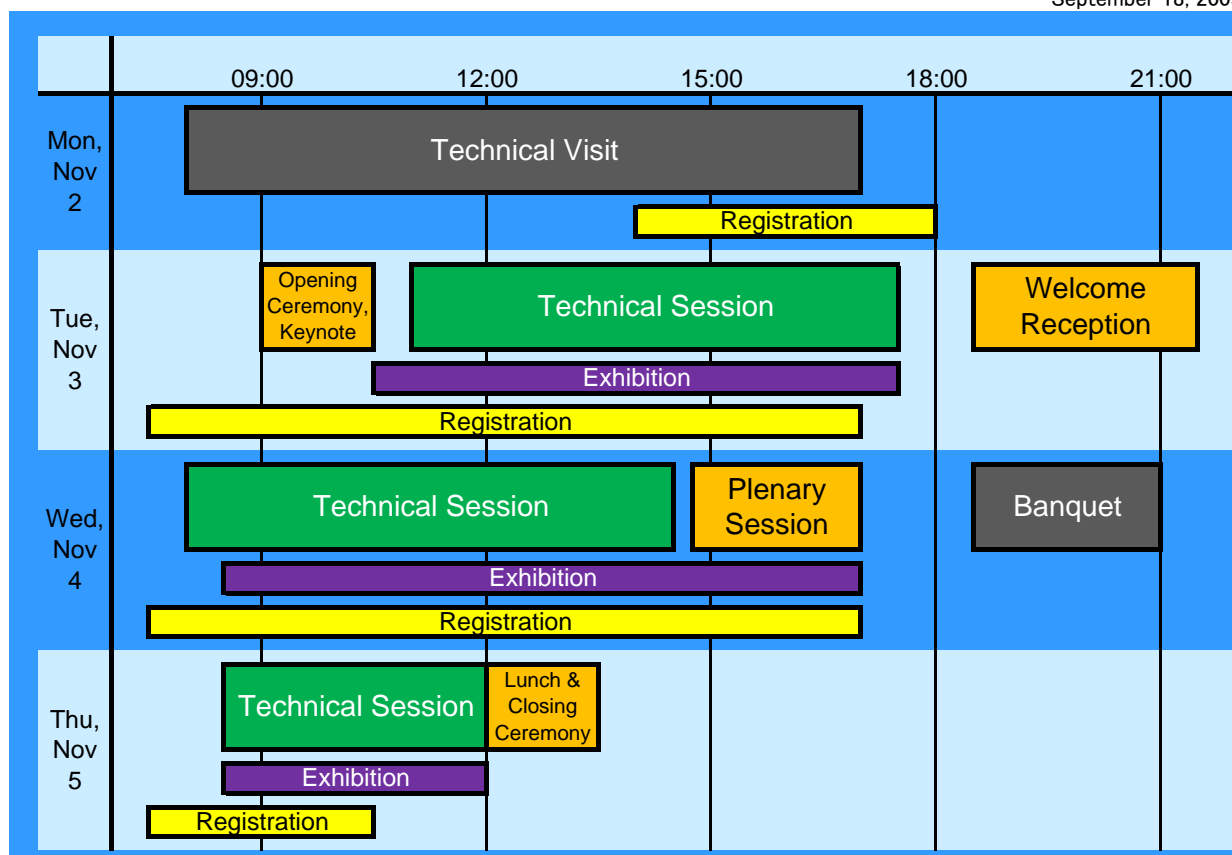
Motorcycle & Scooter Assemblers And Distributors Association of Malaysia

[www.setc2009.com](http://www.setc2009.com)

# Notes

# Schedule Outline

September 18, 2009



Schedule Outline subject to change. Please check for updates at [www.setc2009.com](http://www.setc2009.com) occasionally.



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# Introduction of SETC 2009

**SETC**  
2009

Since its first event in 1989, the Small Engine Technology Conference (SETC) continues to be the international technology conference for small engines and related products. SETC is jointly sponsored by Society of Automotive Engineers of Japan, Inc. (JSAE) and SAE International.

JSAE is pleased to offer the 15<sup>th</sup> SETC in Penang, Malaysia from November 3 to 5, 2009 at Convention & Exhibition Centre, Hotel Equatorial Penang with the support of the Motorcycle And Scooter Assemblers And Distributors Association Of Malaysia (MASAAM).

Considering the circumstances of small engines, arising concerns for global warming and other environmental issues, the main theme for this Conference, "Small Engine Era -- Pursuing a Society Less Dependent on Oil", has been chosen.

CONFERENCE	CITY	COUNTRY
SETC 1989	Milwaukee	USA
SETC 1991	Yokohama & Hamamatsu	Japan
SETC 1993	Pisa	Italy
SETC 1995	Milwaukee	USA
SETC 1997	Yokohama	Japan
SETC 1999	Madison	USA
SETC 2001	Pisa	Italy
SETC 2002	Kyoto	Japan
SETC 2003	Madison	USA
SETC 2004	Graz	Austria
SETC 2005	Bangkok	Thailand
SETC 2006	San Antonio	USA
SETC 2007	Niigata	Japan
SETC 2008	Milwaukee	USA
SETC 2009	Penang	Malaysia



**This event is organized under FISITA Patronage.**

FISITA is the international federation linking the national automotive engineering societies in 38 countries. FISITA was founded in 1948 as a neutral forum for the exchange of technical knowledge on every aspect of vehicle design, development and manufacturing. FISITA is a non-profit organization committed to help create efficient, affordable, safe and sustainable automotive transportation.



# Committee Members

## Honorary Committee 2009

### JSAE

**Chair: Tetsuo Suzuki (Honda R&D Co., Ltd.)**  
 Masanori Atsumi (Suzuki Motor Corporation)  
 Kouichi Miyao (Kawasaki Heavy Industries, Ltd.)  
 Toyoo Ohtsubo (Yamaha Motor Co., Ltd.)  
 Hideo Shoji (Nihon University)  
 Yasushi Tsuritani (Japan Boating Industry Association)  
 Teiichiro Wakayama (Japan Land Engine Manufacturers Association)

### Malaysia

**Chair: Dato' Syed Mohamad Aidid (Motorcycle And Scooter Assemblers And Distributors Association Of Malaysia)**  
 Hamzah Abd. Hamid (PETRONAS Research Sdn. Bhd.)  
 Azhar Aziz (Universiti Teknologi Malaysia)  
 Dato' Gan Ee Kiang (USains Holdings Sdn. Bhd.)  
 Abd. Halim Ismail (Hicom-Honda Manufacturing (M) Sdn. Bhd.)  
 Hiroshi Mitsuyoshi (Boon Siew Honda Sdn. Bhd.)  
 Ng Choong Hai (Hong Leong Yamaha Motor Sdn. Bhd.)  
 Kazumasa Watanabe (Suzuki Assemblers Malaysia Sdn. Bhd.)  
 Raja Dato' Hanipuddin Raja Dato' Nong Chik (Kawasaki Motors (Malaysia) Sdn. Bhd.)

## Organizing Committee 2009

### JSAE

**Chair: Sakae Mizumura (Honda R&D Co., Ltd.)**  
 Takeshi Araki (Kawasaki Heavy Industries, Ltd.)  
 Masayuki Baba (Honda R&D Co., Ltd.)  
 Ryosuke Ishikawa (Suzuki Motor Corporation)  
 Hiroyuki Iwai (Kawasaki Heavy Industries, Ltd.)  
 Mikio Kato (Honda R&D Co., Ltd.)  
 Shunichi Kometani (Yamaha Motor Co., Ltd.)  
 Takashi Mitome (Suzuki Motor Corporation)  
 Masaaki Miura (Yamaha Motor Co., Ltd.)  
 Yuh Motoyama (Yamaha Motor Co., Ltd.)  
 Ryoza Okita (Yamaha Motor Co., Ltd.)  
 Yasuhiro Sugimoto (Honda R&D Co., Ltd.)  
 Yoshihiko Sunayama (Suzuki Motor Corporation)  
 Yoshiro Tokunaga (Kawasaki Heavy Industries, Ltd.)  
 Koji Yoshida (Nihon University)

### Malaysia

**Chair: Dato' Syed Mohamad Aidid (Motorcycle And Scooter Assemblers And Distributors Association Of Malaysia)**  
 Asyraf Ahmad (PETRONAS Research Sdn. Bhd.)  
 Yaakob Baharom (Hicom-Honda Manufacturing (M) Sdn. Bhd.)  
 Amir Abu Bakar (Edaran Modenas Sdn. Bhd.)  
 Chee Kok Leong (Motorcycle And Scooter Assemblers And Distributors Association Of Malaysia)  
 Horizon Gitano (Universiti Sains Malaysia)  
 Celeste Goh (Federation of Asian Motorcycles Industries)  
 Muhamad Hasbullah Ismail (Petroliam Nasional Berhad)  
 Kok Ee Fat (Suzuki Assemblers Malaysia Sdn. Bhd.)  
 Leong King Choon (Hong Leong Yamaha Motor Sdn. Bhd.)  
 Jeffrey Lim (Kawasaki Motors (Malaysia) Sdn. Bhd.)  
 Jeremy Loo (Boon Siew Honda Sdn. Bhd.)  
 Pakharuddin Mohd Samin (Universiti Teknologi Malaysia)  
 Yong Boon Chay (Edaran Modenas Sdn. Bhd.)  
 Khalili Zulkifli (Armstrong Auto Parts Sdn. Bhd.)

# Committee Members

## Technical Committee 2009

### JSAE

**Chair: Yoshiro Tokunaga (Kawasaki Heavy Industries, Ltd.)**

Hidenori Arisawa (Kawasaki Heavy Industries, Ltd.)  
 Hiromi Deguchi (Suzuki Motor Corporation)  
 Minoru Iida (Yamaha Motor Co., Ltd.)  
 Toshimi Kobayashi (Kawasaki Heavy Industries, Ltd.)  
 Takashi Mitome (Suzuki Motor Corporation)  
 Yasuo Moriyoshi (Chiba University)  
 Yasuyuki Muramatsu (Yamaha Motor Co., Ltd.)  
 Toru Nakazono (Yanmar Co., Ltd.)  
 Tadao Okazaki (Kubota Corporation)  
 Ryoza Okita (Yamaha Motor Co., Ltd.)  
 Kazuyuki Shiomi (Honda R&D Co., Ltd.)  
 Tomoo Shiozaki (Honda R&D Co., Ltd.)  
 Yasuyuki Takahata (Yanmar Co., Ltd.)  
 Koji Yoshida (Nihon University)

### SAE International

**Chair: Robert Kee (Queen's University of Belfast)**

Vice Chair: Daniel Nehmer (BRP US Inc.)  
 Michael S. Brenner (Lubrizol Corp.)  
 James Carroll (Southwest Research Institute)  
 Roy Douglas (Queen's University of Belfast)  
 Robert Fleck (Queen's University of Belfast)  
 Jaal B. Ghandhi (University of Wisconsin-Madison)  
 Deane B. Jaeger (Harley-Davidson Motor Co.)  
 Peter Kaub (Re-Sol LLC)  
 Robert G. Kenny (Queen's University of Belfast)  
 Kenneth Kicinski (Harley-Davidson Motor Co.)  
 Nagesh S. Mavinahally (Cummins Inc.)  
 Geoffrey McCullough (Queen's University of Belfast)  
 Jay Meldrum (Keweenaw Research Center, Michigan Technological University)  
 Paul Richards (Innospec Ltd.)  
 Sebastian Strauss (STIHL Inc.)  
 Anthony A. Szczotka (Robert Bosch LLC)  
 Andrew P. Traxel (Briggs & Stratton Daihatsu LLC)  
 Jeff J. White (Southwest Research Institute)

## General Committee

### JSAE

**Chair: Shunichi Kometani (Yamaha Motor Co., Ltd)**

Hiroshi Iio (Suzuki Motor Corporation.)  
 Akio Miguchi (Kawasaki Heavy Industries, Ltd.)  
 Sakae Mizumura (Honda R&D Co., Ltd.)  
 Tadao Okazaki (Japan Land Engine Manufacturers Association)  
 Ryoza Okita (Japan Boating Industry Association)

### SAE International

**Chair: Jay Meldrum (Keweenaw Research Center, Michigan Technological University)**

Vice Chair: James Carroll (Southwest Research Institute)  
 Michael S. Brenner (Lubrizol Corp.)  
 Roy Douglas (Queen's University of Belfast)  
 Robert Fleck (Queen's University of Belfast)  
 Jaal Ghandhi (University of Wisconsin, Madison)  
 Deane B. Jaeger (Harley-Davidson Motor Co.)  
 Peter Kaub (Re-Sol LLC)  
 Robert Kee (Queen's University of Belfast)  
 Robert G. Kenny (Queen's University of Belfast)  
 Kenneth Kicinski (Harley-Davidson Motor Co.)  
 Franz Laimboeck (Ecomotors International Inc.)  
 Nagesh Mavinahally (Cummins Inc.)  
 Geoffrey McCullough (Queen's University of Belfast)  
 Scott A. Miers (Michigan Technological University)  
 Daniel Nehmer (BRP US Inc.)  
 Mark A. Rakoski (Mitsubishi Electric Automotive America)  
 Paul Richards (Innospec Ltd.)  
 Sebastian Strass (STIHL Inc.)  
 Anthony Szczotka (Robert Bosch LLC)  
 Andrew P. Traxel (Briggs & Stratton Daihatsu LLC)  
 Jeff J. White (Southwest Research Institute)  
 Yangbing Zeng (General Motors Corp.)



# Meeting Outline

October 5, 2009

## Monday, November 2

Registration 14:00 - 18:00  
See Floor Guide

Technical Visit See page 10	08:00 - 17:00 at Hotel Equatorial Lobby
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## Tuesday, November 3

Registration 07:30 - 17:00  
See Floor Guide

Opening Ceremony Opening Address Welcome Remarks from the representative of JSAE, SAE International, FISITA and Malaysia	09:00 - 09:30 at Ballroom I & II (Main Wing)
Keynote Address See page 5	09:30 - 10:30 at Ballroom I & II (Main Wing)
Technical Session See page 14	11:00 - 18:00
Lunch	12:30 - 14:00 at Matahari II & III (Executive Wing)
Exhibition See page 9	10:30 - 17:30 at Foyer & Ballroom III (Main Wing)
Welcome Reception See page 12	18:30 - 21:30 at Pool Side

## Wednesday, November 4

Registration 07:30 - 17:00  
See Floor Guide

Technical Session See page 14	08:00 - 14:30
Plenary Session See page 6	14:45 - 17:00 at Ballroom I & II (Main Wing)
Lunch	11:30 - 13:00 at Matahari II & III (Executive Wing)
Exhibition See page 9	08:30 - 17:00 at Foyer & Ballroom III (Main Wing)
Banquet See page 12	18:30 - 21:00 at Revolving Restaurant, 16th floor of Bayview Georgetown Hotel

## Thursday, November 5

Registration 07:30 - 10:30  
See Floor Guide

Technical Session See page 14	08:30 - 12:00
Lunch & Closing Ceremony Paper and Presentation Award Introduction of SETC2010	12:00 - 13:30 at Matahari II & III (Executive Wing)
Exhibition See page 9	08:30 - 12:00 at Foyer & Ballroom III (Main Wing)



# Keynote Speakers

**Tuesday, November 3, 9:30 - 10:30 at Ballroom I & II (Main Wing)**

## **Subject : Small Engines and Their Contribution for a Sustainable Environment**

Wolfgang Zahn has been a Member of the Executive Board of STIHL AG since February 1999. His responsibilities encompass all research and product development worldwide. Mr. Zahn joined STIHL in 1999 as a Executive Board Member to oversee all product engineering and research activities on a global base. Under his supervision STIHL changed nearly the whole product portfolio from regular 2-stroke engines to environmental friendly stratified scavenged engines with low emissions and reduced fuel consumption. A low emission 4-stroke engine, lubricated by oil/fuel mixture was launched as well to series production under his supervision. Mr. Zahn started his career as a development engineer at Mercedes Benz AG (now Daimler AG), resulting in a number of executive positions. Prior to STIHL Zahn worked in the US for an automotive supplier in the position of Vice President R&D worldwide and Managing Director Sales Europe. Mr. Zahn studied mechanical engineering at the University of Stuttgart where he received his masters degree in 1979. He has a lectureship for small engines at Stuttgart University.



**Mr. Wolfgang Zahn**  
**Member of the Executive**  
**Board Research and**  
**Development**  
**STIHL AG**

## **Subject : Small Engine Market Outlook Against Safety and Environment Obligations**

Abdul Harith has been the CEO of Motosikal dan Enjin Nasional Sdn Bhd (MODENAS), since 2006. During his leadership, MODENAS celebrated the rollout of their millionth model in 2007 and he oversaw numerous product launches with the latest culminating in the introduction of the GT128 model recently. Prior to his current position, he was the General Manager at Malaysian Truck & Bus Sdn. Bhd. (MTB) since 1995. Initially involved in forming the DRB-HICOM and ISUZU Motors joint venture company, he was later responsible for the successful rollout of HICOM PERKASA, the first Malaysian National Commercial Vehicle. He later joined Automotive Corporation (M) Sdn. Bhd. (ACM), in 2000 as the CEO/ MD where he managed the marketing of ISUZU and HICOM PERKASA commercial vehicles in Malaysia. He began his career as an Automotive Designer at Perusahaan Otomobil Nasional Berhad (PROTON), later joining Berjaya Group Berhad in 1994 as a Design Manager and was involved in the development of LORIMAS, a National Commercial Vehicle project. A graduate from University Technology MARA (UiTM) in Industrial Design in 1985, he later obtained his Master of Design from the Royal College of Art London, UK. Besides responsibilities as an advisor and external examiner for UiTM, he is also a member of the Malaysian Design Council, initiated under the Ministry of Science, Technology and Innovation to oversee design quality enhancement for the local industries.



**Mr. Abdul Harith bin Abdullah**  
**Chief Executive Officer**  
**Motosikal dan Enjin Nasional**  
**Sdn. Bhd. (MODENAS)**



# Plenary Session

**Wednesday, November 4, 14:45 - 17:00 at Ballroom I & II**

## **Theme: Future Technologies to Address Energy Security and Global Warming**

In the SETC 2009 Plenary Session, the role of small engine, its technology necessary for energy security, and countermeasures against global warming are to be discussed by professionals invited from various fields. Informative speeches and a panel discussion are scheduled. To make it attractive and valuable to all participants, this session includes various topics from wide range of fields with international flavors. We would like to discuss the approach to environmental issues common for all humanity.

## **Moderator**

1990 Graduate from Tokyo Inst. of Tech. (Dr. of Engineering)  
 1990 Research Associate of Chiba Univ.  
 1994 Guest Researcher of Univ. of Texas, Austin  
 1995 Associate Professor of Chiba Univ.  
 2006 Guest Professor of Univ. of Karlsruhe in Germany  
 2008 Professor of Chiba Univ.

1995 JSME Research Encouragement Award  
 1995 JSAE Asahara Research Encouragement Award  
 2001 ILASS-Japan Best Presentation Award  
 2004 JSAE-SAE SETC Best Presentation/ Research Paper Award

## **Major research topics**

Analysis of gasoline engine knocking, fuel spray analysis, control of in-cylinder mixture formation, HCCI combustion analysis, nano particles calculation, new ignition system development, thermal control of IC engine.



**Prof. Yasuo Moriyoshi**  
**Professor**  
**Chiba University**

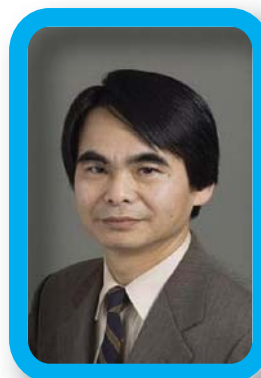
# Plenary Session

SETC  
2009

## Speakers

### Subject : HCCI Combustion Challenge and Future

Norimasa Iida is a Professor in the Faculty of Science and Technology at Keio University, Japan. Professor Iida got his Ph.D. in 1983 from Keio University on the topics of propagation and extinction mechanisms of premixed flames flowing into a narrow channel from a combustible-gas-charged chamber. He spent a very productive year as a Visiting Assistant Professor working at the Engine Research Center, University of Wisconsin-Madison. He used to be a laboratory head of 'Low Heat Rejection Ceramics Two-Stroke Methanol Engine Project' at Kanagawa Academy of Science and Technology. His major research interest is in the combustion and emission of internal combustion engines. He is among the leaders in HCCI combustion research and has published more than 100 papers on the subject, most of which at SAE, JSAE and JSME. He has a special interest in life cycle assessment for next generation vehicles.



**Prof. Norimasa Iida**  
Professor  
Faculty of Science and Technology  
Keio University

### Subject : Future Trend of Market and Technology of Personal Vehicle Including Two-wheelers and Others

Vinay Harne is currently heading Research & Development Department as President (New Product Introduction). B.E. (Mech) from Gujarat University and M.Tech from IIT, Chennai, India. He joined TVS Group in 1982 as Research and Development Engineer. He has been involved in all the new engines developed by the company. He has worked on the areas of fuel economy improvement & exhaust emission reduction. He has also visited various universities and research laboratories in Europe and US as part of work at TVS Research & Development. He has published 5 international technical papers on engines.



**Mr. Vinay Chandrakant Harne**  
President  
Research & Development  
Department, TVS Group





# Plenary Session

## **Subject : Future Technical Trend for Fuel and Lubricant in Malaysia and Southeast Asian Countries**

Zulkurnain Abdul Rahman is currently the General Manager of Powertrain Technology, PETRONAS Research, a position he holds since 2007. His responsibilities cover all powertrain technology-related research and commercialization activities. Under his stewardship, PETRONAS under a joint development venture with BRP-Rotax successfully rolled out the Rotax 4-TEC 1200 engine in September 2008 for Bombardier Recreational Products snow mobile and personal water craft applications. Prior to his current position, he was the Senior Manager in PETRONAS Corporate Planning and Development Division. In this capacity, he was responsible for the PETRONAS FP1 Superbike commercialization programs. A mechanical engineering graduate from Lamar University, Texas,

he started his career as a project management executive in 1987 at PETRONAS Gas Berhad and later joined OGP Technical Services Sdn Bhd as a Project Manager in 1992. With experience in gas, petrochemical power plant and terminal constructions, he was then assigned to Trans Thai Malaysia (TTM) Ltd in 1997 to oversee the development of the gas pipeline systems linking field reserves in a Malaysia-Thailand Joint Development Area to Peninsular Gas Utilization pipeline system in Malaysia's northern state of Kedah.



**Mr. Zulkurnain Abdul Rahman**  
General Manager  
Powertrain Technology,  
Petronas Research Sdn.Bhd.

## **Subject : Technology of Small Electric Powered Vehicle and the Impact of Electric Vehicle on Global Environment**

Yoshihiro Nakazawa is a Chief Engineer for Motorcycle R&D Center of Honda R&D Co., Ltd. He began his professional career at Honda R&D in 1974. In 1990, he became Chief Engineer. In 1995, he transferred to Honda R&D Europe Italy Office as a Manager. After 1999, he returned to his previous department of Motorcycle R&D Center. During these period, he has designed a variety of innovative electrical devices and established unique technologies. As a project leader, he has developed many general purpose electric devices such as Side Stand Inhibitor System and Electric Scooter. In 1994, he published the Paper "Development of an Electric Scooter for Practical Use" in the JSAE Review. For the past 10 years, he

has supervised the Quality Management for all electric devices of Honda's products such as Motorcycle, ATV and Power Water Craft. He graduated from Kanagawa Technical High School in 1970. He holds more than 100 patents for electric technologies. His current research focus is in new Small Electric Vehicle that is well-balanced in safety, performance, ease of use, comfortable, attractive sales price and reduced environmental impact by the application of new environmentally friendly technologies.



**Mr. Yoshihiro Nakazawa**  
Chief Engineer  
Motorcycle R&D Center  
Honda R&D Co.,Ltd.



# Exhibition

The exhibition will offer opportunities for small engine and application products suppliers, manufacturers and research institutions to show-case their products to an elite group of small engine researchers and engineers. Conference participants and visitors will also be able to discuss directly with the exhibitors regarding the various innovative products on display. Companies of small engine industry, involved in vehicles, components, equipment and measuring instruments, will be participating in the exhibition.

## Exhibition Venue

Lower Level Main Wing of Hotel Equatorial Penang. The exhibition is located at the same floor as the main conference presentation rooms and also close to the registration area in the foyer.



## Opening Time of Exhibition

Tuesday, November 3	10:30 to 17:30
Wednesday, November 4	08:30 to 17:00
Thursday, November 5	08:30 to 12:00

## List of Exhibitors

- AVL Pierburg Instruments
- Boon Siew Honda Sdn Bhd
- Cambustion Ltd
- Edaran Modenas Sdn Bhd
- Fuji Seimitsu Co., Ltd
- Hong Leong Yamaha Motor
- Kawasaki Motors (M) S/B
- Keihin (Thailand) Co.,Ltd
- Kilang Rantai S.A. Sdn Bhd
- University of Graz
- BRP-Powertrain GmbH
- Panolin Degussa
- Mazoil Technologies Ltd
- Nitto Denko
- Petronas
- Scion-Sprays Ltd
- Speedy Momentum Sdn Bhd
- Suzuki Assemblers (M) S/B
- VTC Solution Sdn Bhd
- Walbro Engine Management
- WC Heraeus GMBH
- University Science Malaysia
- Evonik
- Infineum



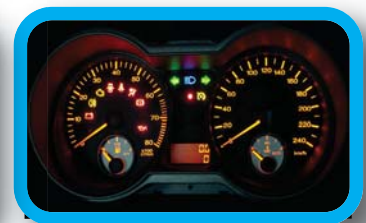
# Technical Visit

Technical visit to the following organizations will be arranged on Monday, November 2. Continental Automotive Malaysia and Motosikal dan Enjin Nasional Sdn. Bhd (MODENAS) are renowned companies in their field of automotive instrumentation components and motorcycles. In addition, you will enjoy a visit to the elaborately ornamented Khoo Kongsi Clan-house and Kek Lok Si Temple as part of Penang heritage tour experience.



Continental Automotive Malaysia is part of Continental AG, which forms a strong group in Malaysia together with Continental's two tires manufacturing plants. Based in Hannover, Germany, Continental AG was founded in 1871 as a rubber manufacturer. With the successful acquisition of Siemens VDO Automotive AG in December 2007, Continental AG ranks as one of the top 5 automotive suppliers in the world.

Continental Automotive Malaysia, the former Siemens VDO Malaysia, is a Tier-1 Vendor for Proton Holdings Berhad. With more than 20 years experience, our instruments plant started in 1985 by supplying instrument cluster to Proton. Since then the supplying profile expanded to other automotive parts such as Oil Pressure Switches, Tank Senders, Fuel Pumps, Fuel Supply Units, Fuel Pressure Regulators, Tank Purge Valves, Electronic Control Units, Sensors, Injectors, Engine Management Systems and Analogue Clocks, starting with Iswara model up to the latest MPV recently launched.



**MODENAS**

The vision of the nation to become industrialized by the year 2020 gave birth to MODENAS. The idea of producing a Malaysian motorcycle and scooter was mooted by our former Prime Minister, Tun Mahathir Mohamad. DRB-HICOM Berhad, the nation's automotive conglomerate, was given the task to head the project

MODENAS was incorporated in August 1995 with an authorized capital of RM200 million. The total investment was RM400 million with the maximum plant production capacity of 200,000 units annually. MODENAS, one of the companies that was created under the national automotive project, undertook the responsibility to acquire the technology to manufacture and produce motorcycles, scooters and small multi-application engines. Kawasaki Heavy Industries, a reputable world class motorcycle manufacturer, is instrumental as the technology partner of MODENAS.



# Technical Visit

SETC  
2009

## Khoo Kongsi

The forefathers of the Khoo family who emigrated from South China built it as a clan-house for members of the Khoo family. It was burned down in 1894 and some believed that it was due to its resemblance to the Emperor's palace. A scaled down version was later built in 1902. The building features a magnificent hall embellished with intricate carvings and richly ornamented beams of the finest wood bearing the mark of master craftsmen from China.



## Kek Lok Si Temple

The temple, built in 1890, took 20 years to complete. Reputed to be the largest and most beautiful Buddhist temple complex in South-east Asia, it features gardens, a giant turtle pool, shrines and beautiful sculptures. The seven-tier pagoda is a shrine dedicated to Bodhisattva Tsi Tsuang Wang, one of the enlightened who declined to enter Nirvana so that he could help bring others to salvation.



## SETC 2009 Technical Visit Itinerary

TIME	TRAVEL PLAN
08:00	Depart from Hotel Equatorial Penang
	Continental Automotive Malaysia
	MODENAS
	Lunch at MODENAS
	Heritage Tour ( Khoo Kongsi & Kek Lok Si Temple )
17:00	Return to Hotel Equatorial Penang

Please check for updates and registration information at [www.setc2009.com](http://www.setc2009.com)





# Special Events

## Welcome Reception

**Hotel Equatorial, Pool Side**  
**Tuesday, November 3, 18:30 – 21:30**

### Free of charge

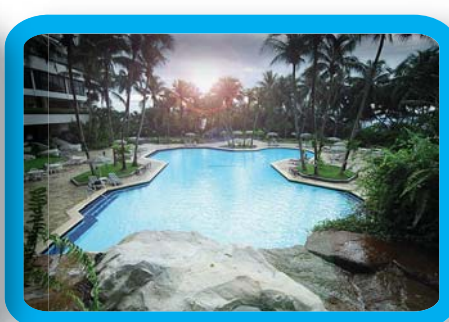
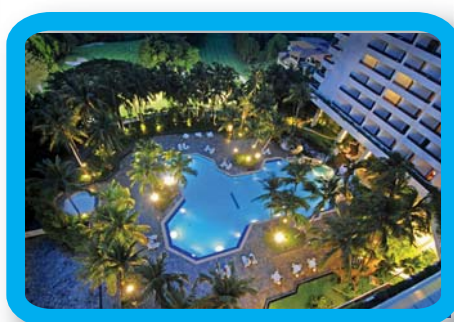
Sponsored by PTT, Chevron Oronite, Evonik Degussa, Infineum, MOTUL and Panolin. Reception is scheduled after the event in the first day, on Tuesday, November 3. It will be held at the pool side of the Hotel Equatorial, where you can enjoy tropical atmosphere in Penang together with local cultural show presented by Tourism Malaysia.



**Oronite**



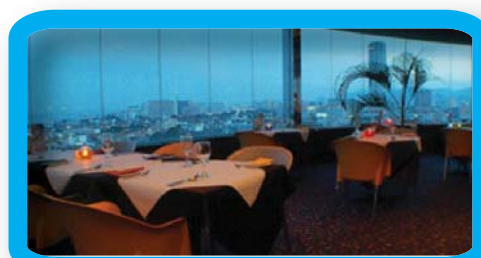
High-Tech Lubricants



## Banquet

**Revolving Restaurant, 16th floor of Bayview Georgetown Hotel**  
**Wednesday, November 4, 18:30 – 21:00**

**US\$ 45** (The advanced registration is required for this event. No on-site ticket available). Register early to take advantage of this opportunity to meet and mingle with the professionals of small engines and their applications from all over the world. Bayview Georgetown Hotel is nestled at the heart of the banking and commercial centres. Within its vicinity, there are plenty of shopping and historical attractions. Shuttle bus will be provided from and to Hotel Equatorial. Join and see the spectacular sunset and excellent views of the city!





# Session Timetable

Oct 5, 2009

	Session Stream	1	2	3	4	5
	Room	Bayan I / Bayan II	Tekukur	Serindit	Cempaka/Anggerik	Teratai / Raya
November 3rd Tuesday	9:00-10:30	Opening Ceremony & Keynote Address (at Grand Ballroom I & II, Main Wing)				
	10:30-11:00	Coffee Break				
	11:00-12:30	Environmental Impacts I	Vehicle Design	Vehicle Dynamics & Safety I	Engine Technology I	Diesel Engines I
		Chair : H. Deguchi	Chair : T. Kobayashi	Chair : T. Koizumi	Chair : K. Shiomi	Chair : T. Nakazono
		Co-Chair : L. Pace	Co-Chair : R. Douglas	Co-Chair : R. Kee	Co-Chair : R. Fleck	Co-Chair : Luigi Allocca
		20097023	20097099	20097060	20097042	20097017
		20097041	20097109	20097081	20097049	20097018
		20097181	20097143		20097059	20097057
	12:30-14:00	Lunch (at Matahari Ballroom II & III, Executive Wing)				
	14:00-15:30	Environmental Impacts II	Materials I	Vehicle Dynamics & Safety II	Engine Technology II	Diesel Engines II
		Chair : H. Deguchi	Chair : S. Kometani	Chair : T. Koizumi	Chair : K. Shiomi	Chair : T. Nakazono
		Co-Chair : J. Carroll	Co-Chair : J. Meldrum	Co-Chair : D. Jajcevic	Co-Chair : J. Furlinger	Co-Chair : R. Douglas
		20097102	20097010	20097146	20097083	20097105
		20097158	20097065	20097152	20097129	20097159
			20097076		20097051	20097037
	15:30-16:00	Coffee Break				
	16:00-17:30	HCCI I	Materials II	NVH Technology	Engine Technology III	Alternative Fuels I
		Chair : M. Iida	Chair : S. Kometani	Chair : T. Okazaki	Chair : T. Kobayashi	Chair : T. Shiozaki
		Co-Chair : J. Allen	Co-Chair : R. Kee	Co-Chair : J. Carroll	Co-Chair : R. Fleck	Co-Chair : Luigi Allocca
		20097070	20097082	20097128	20097069	20097026
		20097079	20097173	20097131	20097011	<del>20097136</del>
		20097035		20097015	20097122	20097113
November 4th Wednesday	8:00-9:30	Two Stroke Engines I	Design & Simulation I	Collegiate Events I	Advanced Combustion I	Alternative Fuels II
		Chair : T. Shiozaki	Chair : H. Arisawa	Chair : T. Mitome	Chair : Y. Moriyoshi	Chair : K. Yoshida
		Co-Chair : S. Schmidt	Co-Chair : T. Bo	Co-Chair : G. Bower	Co-Chair : R. Fleck	Co-Chair : D. Jajcevic
		20097032	20097089	20097103	20097047	20097040
		20097077	20097054	20097107	20097068	20097111
	9:30-10:00	Coffee Break				
	10:00-11:30	Two Stroke Engines II	Design & Simulation II	Collegiate Events II	Advanced Combustion II	Alternative Fuels III
		Chair : T. Shiozaki	Chair : H. Arisawa	Chair : T. Mitome	Chair : Y. Moriyoshi	Chair : K. Yoshida
		Co-Chair : J. Tromayer	Co-Chair : R. Douglas	Co-Chair : G. Bower	Co-Chair : R. Kee	Co-Chair : T. Bo
		20097046	20097176	20097147	20097045	<del>20097445</del>
		20097013	20097130	20097154	20097119	<del>20097447</del>
		20097030	20097163	20097177	20097135	
	11:30-13:00	Lunch (at Matahari Ballroom II & III, Executive Wing)				
	13:00-14:30	Hybrids, Electric Drives & Fuel Cells	Lubricants	Collegiate Events III	Advanced Combustion III	Alternative Fuels IV
		Chair : Y. Muramatsu	Chair : T. Kobayashi	Chair : M. Kato	Chair : Y. Motoyama	Chair : T. Nakazono
		Co-Chair : J. Furlinger	Co-Chair : J. Meldrum	Co-Chair : G. Davis	Co-Chair : S. Schmidt	Co-Chair : R. Douglas
		20097031	20097080	20097169	20097144	20097120
		20097061	20097075	20097170	20097095	20097168
			20097178	20097108	20097097	
	14:30-14:45	Coffee Break				
	14:45-17:00	Plenary Session (at Grand Ballroom I & II, Main Wing)				
November 5th Thursday	8:30-10:00	Fuel Supply Systems I	Collegiate Events IV	Engine Control I	HCCI II	Alternative Fuels V
		Chair : Y. Muramatsu	Chair : M. Kato	Chair : R. Okita	Chair : M. Iida	Chair : T. Okazaki
		Co-Chair : J. Allen	Co-Chair : G. Davis	Co-Chair : R. Kee	Co-Chair : R. Kirchberger	Co-Chair : G. Bower
		20097044	20097171	20097019	20097085	20097066
		20097055	20097185	20097034	20097086	20097100
		20097056	20097188	20097073	20097087	20097132
	10:00-10:30	Coffee Break				
	10:30-12:00	Fuel Supply Systems II	Design & Simulation III	Engine Control II	HCCI III	Alternative Fuels VI
		Chair : Y. Muramatsu	Chair : Y. Sunayama	Chair : R. Okita	Chair : M. Iida	Chair : T. Okazaki
		Co-Chair : J. Tromayer	Co-Chair : R. Douglas	Co-Chair : J. Meldrum	Co-Chair : R. Kirchberger	Co-Chair : J. Carroll
		20097074	20097024	20097124	20097072	20097063
		20097149	20097164	20097014	20097021	20097048
		20097112	20097101	20097118	20097141	
	12:00-13:30	Lunch & Closing Ceremony (at Matahari Ballroom II & III, Executive Wing)				

This timetable is tentative and subject to update anytime. Please check this web page frequently.  
Paper No. is based on JSAE. SAE number is 2009-32-0\*\*\*, in which \*\*\* is last three figures of JSAE number.

### Organizers:

Yasuo Moriyoshi, (Chiba University); Jaal B Ghandhi, (University of Wisconsin Madison)

20097043

### Development of NO<sub>x</sub> Reduction System Using Exhaust Valve Controls for Motorcycle Small Engine

Kazuo Fujihara, Yamato Nakamizo, Mitsuru Kojima, Teruhide Yamanishi, (Honda R&D Co., Ltd.)

20097045

### Simulation and Experimental Investigations of a Direct-Injection Combustion System for High Speed – High Performance Engines

Stephan P Schmidt, Martin Abart, Oliver Schögl, Alexander Trattner, Roland Kirchberger, Helmut Eichlseder, (Graz University of Technology)

20097047

### Effective Engine Downsizing Through the Use of Compression Ignition 2-Stroke Engine with Novel Combustion Cycle Involving Oxygen and Water

Azmi Osman, (PETRONAS Research Sdn.Bhd.)

20097068

### Testing and Evaluation of Fuel Properties Effect on High Speed Engine Performance

Zulkhairi Salleh, Chan Ming Yau, Wan Ahmad Nadzri, (PETRONAS)

20097095

### The Effect of Corona Discharge on Pre-Mixed Combustion

Koji Yoshida, Yusuke Soma, (Nihon University);

20097097

### Studies on Reducing Cycle-by-Cycle Variations and Improving Performance of a Small Carbureted Gasoline Engine

M Krishnasamy, (TVS Motor Company Ltd); A Ramesh, MKG Babu, (Indian Institute of Technology, Madras); YR Babu, (TVS Motor Company Ltd.)

20097119

### Very Lean and Diluted SI Combustion Using a Novel Ignition System with Repetitive Pulse Discharges

Tatsuya Kuboyama, Yasuo Moriyoshi, (Chiba Univ.); Eiki Hotta, (Tokyo Inst. of Tech.); Yuichiro Imanishi, (NGK Insulators); Naohiro Shimizu, (NGK Insulators); Kimitoshi Tanoue, (Oita Univ.); Katsuji Iida

20097135

### Effect of Boost Pressure on Engine Performance and Exhaust Emissions in Direct-Injection Compressed Natural Gas (CNG-DI) Spark Ignition Engine

Girma Tadesse, (Universiti Teknologi PETRONAS)

20097144

### The Diffusion Combustion Induced by the High Voltage Electrical Discharge - The Influence of Fuel Property on Combustion Behavior

Yohsuke Takeshita, Koji Yoshida, (Nihon University)

## Alternative Fuels

### Organizers:

Koji Yoshida, (Nihon University); Tomoo Shiozaki, (Honda R&D Co.,Ltd.); Tadao Okazaki, (Kubota Corporation); Paul Richards, (Innospec Ltd.)

20097026

### Experimental Investigation of Performance and Emissions of a Sequential Port Injection Compressed Natural Gas Converted Engine

How Heoy Geok, Taib Iskandar Mohamad, Shahrir Abdullah, (Universiti Kebangsaan Malaysia)

20097040

### Experimental Studies of Bio-Diesel Fuels on Pollutant Emissions from Small Automotive Diesel Engine

Nafis Ahmad, A. Y. F. Bokhary, (King Abdulaziz University); M. Ashar, U. Akhtar

20097048

### Study on Single Cylinder Engine for Performance and Exhaust Emission Characteristics with Diesel, Bio Diesel, LPG and CNG as a Fuel

Syed Kaleemuddin Mohiuddin, (Greaves Cotton Limited); Ambaprasad Rao, (National Institute of Technology Warangal)

20097063

### A Study of IDI 2-Stroke Cycle Compression Ignition Engine with DME

Noritaka Yoshikawa, Koji Yoshida, (Nihon university); Tatsuaki Suzuki, (Hiroshima Institute of Technology)

20097066

### Study on Biomass Gas HCCI Engine

Yudai Yamasaki, Masanobu Kanno, Yasuhiro Taura, Shigehiko Kaneko, (University of Tokyo)



20097100

**Influence of Various Biodiesel Fuels on Diesel Engine Performance**

Masashi Ono, Masato Nakajima, Koji Yoshida, Hideo Shoji, Akira Iijima, (Nihon University)

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20097111

**Investigations on Operation of CI Engine Using Liquefied Petroleum Gas and Mahua Biodiesel in Mixed Fuel Mode**

Kapilan Natesan, (National Institute of Technology Karnataka); T. P. Ashok Babu, (NITK University), R. P. Reddy, (Reva Institute of Technology)

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20097113

**Flame Propagation of Bio-Ethanol in a Constant Volume Combustion Chamber**

Chinda Charoenphonphanich, Prathan Srichai, (King Mongkut's Institute of Technology Ladkrabang)

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20097120

**Stability, Performance and Emission Characteristics of Diesel-Ethanol Blend with Castor Oil as Additive in Variable Compression Ratio Engine**

V. Arul Mozhi Selvan, R. B. Anand, M. Udayakumar, (National Institute of Technology, Tiruchirappalli)

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20097132

**Application of Newly Developed Cellulosic Liquefaction Fuel for Diesel Engines**

Nin En, Koji Yoshida, Hideo Shoji, Akira Iijima, Masashi Ono, Noritaka Yoshikawa, (Nihon University)

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20097168

**Combustion and Emissions Characteristics of a Charcoal-HFO Slurry (Bio-COM) in a Diesel Engine**

Valentin A. Soloiu, (Georgia Southern University); Yoshinobu Yoshihara, Kazuie Nishiwaki, (Ritsumeikan University)



**Organizers:**

Takashi Mitome, (Suzuki Motor Corporation); Geoffrey McCullough,  
(Queens University of Belfast)

20097092

**Formula SAE Space Frame Design**

Ryo Masutani, Daisuke Ito, Yasufumi Oguri, Takashi Suzuki, Sophia University

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20097103

**Improving Vehicle Performance by Aerodynamic Devices in Formula SAE**

Mitsuru Wakabayashi, Kanako Komuro, Olivier Pedoussaut, Yasufumi Oguri, Takashi Suzuki,  
(Sophia University)

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20097107

**Inspiring a College Campus to Design, Create and Build Green Small Engine Vehicles**

Robert D Garrick, Clark Hochgraf, (Rochester Institute of Technology)

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20097108

**Design and Construction of a High-Efficiency Electric Drivetrain for a Zero-Emissions Snowmobile**

Glenn R Bower, Nick J. Rakovec, (University of Wisconsin); Adam R. Schumacher, Kevin R. King,  
John Deere; Daniel Bocci, (Argonne National Laboratories); Ethan K. Brodsky, Glenn R. Bower,  
(University of Wisconsin)

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20097147

**A Study on Improvement of Road Ability of A Formula SAE Vehicle**

Tomoaki Kodama, Hiroyuki Oda, Takanori Furumido, Yusuke Ohira, Yasuhiro Honda, Katsuhiko  
Wakabayashi, (Kokushikan University)

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20097154

**A Trial of Engine Performance Improvement with a Turbocharger in Consideration of Intake Pipe  
Runner Length for Formula SAE**

Yasuhiro Honda, Atsushi Kawamura, Shinya Matsumoto, Shuhei Yamamoto, Yusuke Ohira,  
Tomoaki Kodama, Katsuhiko Wakabayashi, (Kokushikan University)

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20097169

**Torque Control of the Small Gasoline Engine with the Variable Nozzle Turbine Turbo-Charger**

Kenichi Shimizu, Hiroshi Enomoto, Kyohei Takahashi, Wataru Sato, Hiroyasu Motoi,  
(Kanazawa University); Masahiro Yashiro, (Honeywell)

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20097170

**Effect of the Seat Belt Positions on the Passenger Injury during Low Speed Front-End Impact**

Tatsuya Fukui, Yusuke Miyazaki, Hiroshi Enomoto, Yasuhito Niwa, (Kanazawa University)

20097171

**Decreasing of the Idle Engine Speed of the Small Gasoline Engine with PID Control**

Tatsuya Fukui, Hiroshi Enomoto, Taira Maeda, Yosuke Fukunaga, Masahiro Kontani,  
Toshiyuki Sakai, (Kanazawa University)

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20097177

**Development of the Kettering University Snowmobile for the 2009 SAE Clean Snowmobile Challenge**

Andrew Baker, Gregory W. Davis, (Kettering University)

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20097185

**Combustion System Development and Analysis of a Downsized Highly Turbocharged PFI Small Engine**

William P. Attard, Elisa Toulson, Ferenc Hamori and Harry C. Watson, (University of Melbourne)

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20097188

**Combustion System Development and Analysis of a Carbureted and PFI Normally Aspirated Small Engine**

William P. Attard, Elisa Toulson, Ferenc Hamori and Harry C. Watson, (University of Melbourne)



**Organizers:**

Yasuyuki Takahata, (Yanmar Co., Ltd.); Andrew P Traxel, (Briggs & Stratton Daihatsu LLC)

20097017

**Analysis of Droplets Evaporation Process of Diesel Spray at Ignition Delay Period Using Double Nano-spark Shadowgraph Photography Method**

Abdullah Adam, Tomoaki Yatsufusa, Tomonori Gomi, Nobuyuki Irie, Yoshiyuki Kidoguchi,  
(The University of Tokushima)

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20097018

**Analysis of Relation between Mixture Formation during Ignition Delay Period and Burning Process in Diesel Combustion**

Khalid Amir, Tomoaki Yatsufusa, Takayuki Miyamoto, Jun Kawakami, Yoshiyuki Kidoguchi,  
(The University of Tokushima)

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20097037

**Effects of Thermal Barrier Coating on Diesel Engine Driven by 1, 4 Dioxane Ethanol Diesel Blends**

Chockalingam Sundarraj, (Bharathiyar College of Engineering and Technology); S. Arul,  
(Panimalar College of Engineering); S. Sendilvelan, (Dr.M.G.R. Educational and Research  
Institute); C. G. Saravanan, (Annamalai University)

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20097057

**Development of Newly Concept Diesel Engine for Industrial Use**

Masato Ueda, Masayasu Takami, Tamon Tanaka, Koichi Funaki, Hideya Miyazaki,  
(Kubota Corporation)

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20097105

**Light Duty Diesel Engine: Optimization of Performances, Noxious Emission and Radiated Noise**

Luigi Allocca, Consiglio Nazionale Ricerche; Costa Michela, Siano Daniela, (CNR - Istituto Motori);  
Bozza Fabio, (DIME - Univ. of Napoli); Montanaro Alessandro, (CNR - Istituto Motori)

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20097159

**Simulation and Analysis of Combustion, Performance and Emission Characteristics of Biodiesel Fueled Low Heat Rejection Direct Injection Diesel Engine**

B Rajendra Prasath, P.Tamilporai, Mohd.F.Shabir, (Anna University, Chennai); T.Senthil Kumar,  
(Anna University, Trichy)



## Design & Simulation

### Organizers:

Hidegori Arisawa, (Kawasaki Heavy Industries, Ltd.); Roy Douglas, (Queens University of Belfast)

20097024

#### **Symmetry and Time Delayed Boundary Condition for CFD Simulation and Its Application in a Two-Cylinder Two-Stroke Engine**

Dalibor Jajcevic, Raimund A. Almbauer, Stephan P. Schmidt, (Graz University of Technology); Karl Glinsner, (BRP Rotax)

20097054

#### **Mount Force Reduction in a Scooter Engine Mounting System**

Manjunath Bhat, Manjunath Bhat, (TVS Motor Company Limited); C. Padmanabhan, (Indian Institute of Technology Madras, Chennai); Kannan Marudachalam, (TVS Motor Company Limited)

20097089

#### **Desk Evaluation Approach of Timing Chain System in Single Cylinder Engines**

Keiichi Dan, (Honda R&D Co., Ltd.)

20097101

#### **Development of a Combustion Process by the Use of a Coupled 1D / 3D Simulation Strategy**

Oliver Schoegl, Schmidt Stephan, Abart Martin, Kirchberger Roland, Eichlseder Helmut, (Graz University of Technology)

20097130

#### **Side Opening Intake Simulation and Validation for a Sleeve Valve Port Application**

Muhammad Hafidz Rahmat, Asyraf bin Ahmad, Mohd Faizan bin Ahmad Zuhdi, (PETRONAS Research Sdn. Bhd.)

20097138

#### **Simultaneous Evaluation on Engine-cooling and Aerodynamics Performance for Motorcycle Using CFD Analysis**

Toshihisa Abe, Tohru Shimizu, Yoshihiko Sunayama, Suzuki Motor Corporation

20097163

#### **Prediction of Spark Ignition Engine Performance by Thermodynamic Simulation of a Real Cycle**

Mehrnoosh Dashti, (Azad University); Ali Asghar Hamidi, (University of Tehran); Ali Asghar Mozafari, (Sharif University of Technology)



20097164

**Multiple-Cylinder Diesel Engine CFD Simulation Using VECTIS**

Tao Bo, Gang Li, Jawahar Palaniyandi, Robert Hunt, Chris Rowe, (Ricardo UK Ltd)

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20097176

**Miniature HCCI Free-Piston Engine Compressor For Orthosis Application**

Lei Tian, David B. Kittelson, William K. Durfee Mechanical Engineering, (University of Minnesota)

**Engine Components**

**No Paper**

## Engine Control

### Organizers:

Ryozo Okita, (Yamaha Motor Co., Ltd); Anthony A Szczotka, (Robert Bosch LLC)

20097014

### Modeling and Control of Variable Intake Valve Actuation in IC Engines

Chun-Hsien Wu, Pei-Jen Wang, (National Tsing Hua University)

20097019

### Intelligent Engine Management System for Small Handheld Low Emission Engines

Matthias Hehnke, Claus Naegele, Heinrich Leufen, Andreas Baehner, (Andreas Stihl AG & Co. KG)

20097034

### Small Motorcycle Electronic Port Fuel Injection Retrofitting

Teoh Say Lai, Horizon Gitano-Briggs, (Universiti Sains Malaysia)

20097073

### Low Cost Electronic Control Units for Low Emission Motorcycles Engines: a Solution Based on the Integration of Analog Functions

Marco Sacchi, Ralph Ferrara, Neng-Hau Ching, (Freescale Semiconductor)

20097118

### An Ion Current Based Cylinder Pressure Estimation for Knock Detection and Control in a Single Cylinder Spark Ignition Engine

Davinder Kumar, (TVS Motor Company); A. Ramesh, MKG Babu, (Indian Institute of Technology Madras, Chennai)

20097124

### Development of Electronic Throttle Control System for Motorcycle

Takuya Sakamoto, Takeru Oshima, Yoshiaki Tani, Masashi Fukuuchi, Shinichi Kuratani, (Kawasaki Heavy Industries, Ltd.)



**Organizers:**

Kazuyuki Shiomi, (Honda R&D Co., Ltd.); Nagesh S Mavinahally, (Cummins Inc.)

20097011

**Preliminary Study on Design and Control of a Novel Automotive CVT**

Ka U Chan, P.K.Wong, H.W.Wu, (University of Macau)

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20097042

**Research on Extended Expansion General-Purpose Engine - Noise Characteristics Caused by Multiple Linkage System and Improvement of the Noise**

Gaku Naoe, Sei Watanabe, (Honda R&D Co., Ltd.)

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20097049

**Improvement of a Fuel Consumption of Small Motorcycle Engine with YMJET-FI**

Yoshitaka Nagai, Katsumi Suzuki, Wataru Ishii, Takanori Tamura,  
Hiroyuki Tsuzuku, (Yamaha Motor Co. Ltd)

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20097051

**Study on Similarity of Pumping Flow in Engine Crankcase**

Hidenori Arisawa, Motohiko Nishimura, Hiroyuki Watanabe, Atsushi Ueshima, Kazuki Arima,  
Akiyuki Yamasaki, (Kawasaki Heavy Industries, LTD.)

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20097059

**Technologies for Enabling Concept of New-geometry V-Type 4-cylinder Engine**

Toru Kisaichi, (Honda R&D Co., Ltd.)

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20097069

**Power Restriction on Small Capacity Four Stroke Engines by Exhaust Gas Recirculation – A New Way of Speed Limiting with Reduced Exhaust Emissions?**

Juergen Tromayer, Gerd Neumann, Roland Kirchberger, Helmut Eichlseder,  
(Graz University of Technology)

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20097083

**Development of Technologies for Improving Fuel Economy of Small Motorcycle Engines**

Satoshi Iijima, Ryo Kubota, Kazunori Kikuchi, (Honda R&D Co., Ltd.)



20097122

#### **Development of the New Rotax 1200 4-TEC Powersports Engine: From Concept to Production**

Dali Abdul Latiff Aw, (PETRONAS Research Sdn. Bhd.); Stefan Leiber, Ralf Rokita, Michael Gumpesberger, (BRP-Powertrain GmbH & Co KG); Fadhli Wong Mohd Hasan Wong, Fauzy Omar Basheer Othman, (PETRONAS Research Sdn. Bhd.)

20097129

#### **Fuel Film Behaviour Analysis Using Simulated Intake Port**

Minoru Iida, K. Yoshikawa, H. Tanaka, (Yamaha Motor Co., Ltd); G. Wang, C. Arcoumanis, (City University London)

## **Environmental Impacts**

#### **Organizers:**

Hiromi Deguchi, (Suzuki Motor Corporations); Jeff J White, (Southwest Research Institute)

20097023

#### **Influence Factor Analysis of Light-Off Temperature Tests for Motorcycle Catalytic Converters**

Manqun Lin, Hongda Qu, Xicheng yan, Bin Jia, Jing Qin, Bin Xu, Wei Wang, (Tianjin University)

20097041

#### **Study of the Effects on the Emission of Purge Fuel from Carbon Canister and It's Control Strategies in Motorcycles**

Jing Qin, Xicheng Yan, Manqun Lin, Baohua Zhu, Junjie Zhang, (Tianjin University)

20097102

#### **Innovative 2 Wheeler's Substrate Developments for EU5**

Lorenzo Pace, (Emitec G.m.b.H.); Martin Forster, Richard Humer, Daniel Mairhörmann, Rudolf Prem, (KTM Spotmotorcycles AG); Francois Jayat, Roman Konieczny, (Emitec G.m.b.H)

20097158

#### **Catalytic coatings for Effective Emission Reduction in Small Motorcycle Application**

Ansgar Wille, M. Bonifer, (W.C. Heraeus)

20097181

#### **Canister Purge Flow Control Study on EFI Single Cylinder Small Engine**

Tian Liangyun, Han Benzong, (United Automotive Electronic System Co., Ltd.); Xi Gang, Zhang Zhen, Chen Siyuan, Thilo Leineweber, (United Automotive Electronic System Co., Ltd.); Xie Deyun, (Jianshe Motorcycle Industry Group)



**Organizers:**

Yasuyuki Muramatsu, (Yamaha Motor Co., Ltd.); Peter Kaub, (Re-Sol LLC)

20097044

**Flexible Fuel System for Small Motorcycles**

Atsushi Ito, Koji Yamada, Toshiyuki Kubota, Hideya Horie, Yoichi Takahashi,  
Shiro Kokubu, (Honda R&D Co., Ltd.)

20097055

**Development of a Small Low-cost Fuel Injector to Overcome Diversification of Requirements in Global Markets**

Daisuke Matsuo, Kazuhiko Sato, Akihiko Haramai, Minoru Ueda, (Keihin Corporation)

20097056

**Development of DBW Throttle Body for V4 Engines**

Daisuke Shiraida, Takefumi Maruyama, Minoru Ueda, (Keihin Corporation)

20097074

**Variable Density Distribution of CNG Jet Injected at Small Injection Pressure**

Emishaw Dandena Iffa, Abdul Rashid Abdul Aziz, (Universiti Teknologi PETRONAS)

20097112

**Ethanol Impacts on Fuel Supply Parts of Vehicles in Thailand**

Chinda Charoenphonphanich, Kalong Buanak, Panya Kansuwan,  
(King Mongkut's Institute of Technology Ladkrabang)

20097149

**Low Cost EFI for 2 and 3 Wheeled Motorcycles**

Jeffrey Allen, B. Smither, P. Ravenhill, R.Hoolahan, G. Farmer, (Scion-Sprays Ltd.)

## Organizers:

Minoru Iida, (Yamaha Motor Co Ltd); Jaal Ghandhi, (University of Wisconsin Madison)

20097021

### Effect of Spark Assistance on Improving Cyclic Stability of Auto-Ignition in a Small Two-Stroke Engine

Janitha Sumadhawa Wijesinghe, Guang Hong, (University of Technology, Sydney)

20097035

### A Dual Fuel System to Achieve High Equivalence Ratio and High Engine Performance in HCCI Mode

Bancha Thanapiyawanit, Lu Jau-Huai, (ChungHsing University)

20097070

### A Study of HCCI Combustion Using Spectroscopic Techniques and Chemical Kinetic Simulations

Akira Iijima, Koji Yoshida, Hideo Shoji, (Nihon University)

20097072

### Spark Ignition and Spark-Assisted, Controlled Auto-Ignition in an Optical Gasoline Engine

Steven M Begg, (University of Brighton, UK) ; Morgan Heikal, (University of Brighton, UK)

20097079

### Improvement of Natural-gas HCCI Combustion by Internal EGR by Means of Exhaust Valve Re-Opening

Kiyoshi Kawasaki, Koji Yamane, (The University of Shiga Prefecture); Hiroyuki Ohtsubo, Toru Nakazono, (Yanmar) ; Kazuki HIROTA, Shingo NAGATA(The University of Shiga Prefecture)

20097085

### An Investigation of the Potential of Thermal and Mixing Stratifications for Reducing Pressure Rise Rate on HCCI Combustion by Using Rapid Compression Machine

Daisuke Shirota, (Keio University Graduated School); Norimasa Iida, (Keio University)

20097086

### Analysis of the Combustion Dispersion Mechanism in HCCI Engine

Chao Shi, Kenichiro Nagai, (Keio University Graduated School) ; Norimasa Iida, (KEIO University)

20097087

### Mechanism Analysis of Influence of Engine Speed on HCCI Combustion by Using Numerical Calculation

Hiroki Iino, Kenji Shigetoyo, Mari Nagae, (Keio University Graduated School) ; Norimasa Iida, (KEIO University)

20097141

### The Research about Thermal Stratification with Booster pressure Effect on Pressure Rise Rate in HCCI Engine using multi-zone model

Ock Taeck LIM, O Seok Kwon, DongWon Jeong, (University of Ulsan) ; Norimasa Iida, (KEIO University)





**Organizers:**

Yasuyuki Muramatsu, (Yamaha Motor Co., Ltd.); Jay Meldrum, (Michigan Technological University)

20097031

**Development and Operation of a 1kW Direct Methanol Fuel Cell Stack**

Kazuyoshi Furukawa, Yasuyuki Muramatsu, Shuhei Adachi, (Yamaha Motor Co., Ltd.)

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20097061

**Well-To-Wheel Energy Analysis of Conventional and Electric Motorcycles in Malaysia**

Ahmad Syazli Mohd Khalil, Horizon Gitano-Briggs, (Universiti Sains Malaysia)

**Lubricants**

**Organizers:**

Hideo Kaido, (Kawasaki Heavy Industries), Ltd.; Michael S Brenner, (Lubrizol Corp.)

20097075

**Development of Catalyst-Friendly FC-W® Certified Marine Oils Utilizing Novel ZDP Technology**

Brent Richard Dohner, Mike Brenner, Ewa Bardasz, (The Lubrizol Corporation)

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20097080

**Performance of Motorcycle Engine Oil with Sulfur-Based Additive as Substitute ZN-DTP (Part II)**

Nobuaki Watanabe, Akira Mitarai, (Idemitsu Kosan Co.,Ltd.)

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20097178

**Test Method for Evaluating Gear Fatigue Life of 4-Stroke Motorcycle Engine Oils**

Hitoshi Hamaguchi and Hideo Tanaka, (Evonik Degussa Japan Co., Ltd.);

Thorsten Bartels, (Evonik RohMax Additives GmbH)

## Materials

### Organizers:

Takashi Mitome, (Suzuki Motor Corporation); James Carroll, (Southwest Research Institute)

20097010

### Weight Saving in Small Engine and Vehicle Components by Utilization of Die Cast Mg Alloy

Hiroyuki Omura, Tatsuki Yonemaru, Jo Asada, (Ryobi Limited); Hideharu Nakashima, (Kyushu University)

20097065

### Research on Pb-free Electroless Ni Plating for Pistons of General-purpose Engines

Kenji Suto, Tomonori Saito, (Honda R&D Co.,Ltd.); Sumitaka Watanabe, (Japan Kanigen Co.,Ltd.)

20097076

### Development of Nitrocarburized High Strength Crankshaft Controlling Vanadium Carbonitride Precipitation by Normalizing

Satoru Suwa, Daiji Kawaguchi, Atsushi Murakami, (Honda R&D Co., Ltd.)

20097082

### Development of High Fatigue Strength Valve Spring Using Compound Layer Control by Nitriding

Keiichi Maekawa, Atsushi Murakami, (Honda R&D Co., Ltd.)

20097173

### Establishment of Judder Analysis Technique & New Friction Material

Kazuyoshi Miyachi, (FCC(Thailand)Co.,Ltd.)

## NVH Technology

### Organizers:

Tadao Okazaki, (Kubota Corporation); Kenneth Kicinski, (Harley-Davidson Motor Co.)

20097015

### On Experimental Techniques to Determine Acoustic Performance of Small Exhaust Silencers

Jüri Lavrentjev, Hans Rämmal, (Tallinn University of Technology)

20097128

### Damping Loss Factor Prediction in Statistical Energy Analysis for Co-Generation System Enclosure

Satoshi Morita, Nobutaka Tsujiuchi, Takayuki Koizumi, Satoshi Morita, (Doshisha University); Hiroshi Uehara, (Yanmar Co.,Ltd.)

20097131

### Evaluation of Feeling of Pulse for Cruiser-Type Motorcycle

Takahisa Onishi, Takayuki Koizumi, Nobutaka Tsujiuchi, Takahisa Onishi, (Doshisha University)



**Organizers:**

Tomoo Shiozaki, (Honda R&D Co., Ltd.); Robert G Kenny, (Queens University of Belfast)

20097013

**Knocking Investigations in a small Two-Stroke SI Engine**

Kai Schreer, Kai W. Beck, Sören Bernhardt, Ulrich Spicher, (Universitaet Karlsruhe (TH) );  
Werner Geyer, Stephan Meyer, (Andreas STIHL AG & Co. KG)

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20097030

**Spectroscopic Measurements in Small Two-Stroke SI Engines**

Kai W. Beck, Thomas Heidenreich, Steve Busch, Ulrich Spicher, (Universität Karlsruhe (TH));  
Tim Gegg, Armin Kölmel, (Andreas STIHL AG & Co. KG)

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20097032

**Development of the Gaseous Fuel Direct Injection System for Small Two-Stroke Transports**

Teoh Yew Heng, Horizon Gitano-Briggs, Tan Yee Hern, (University Science Malaysia)

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20097046

**Simulation of Scavenging Process, Internal Mixture Preparation, and Combustion of a Gasoline Direct Injection Two-Cylinder Two-Stroke Engine**

Dalibor Jajcevic, Raimund A. Almbauer, Stephan P. Schmidt, (Graz University of Technology);  
Karl Glinsner, (BRP Rotax, Austria)

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20097077

**Application of Scavenging-Port Injection of CNG to a Boat Engine at Running Conditions**

Ryosuke Shiina, Hideaki Suzuki, Mikiya Araki, Hisao Nakamura, Seiichi Shiga, (Gunma University);  
Hideo Kishimoto, (Yamato Motor, Co., Ltd.)

## Vehicle Design

### Organizers:

Yoshiro Tokunaga, Toshimi Kobayashi, (Kawasaki Heavy Industries, Ltd.)

20097099

### Design and Development of a Three-Wheeler Engine for Improved Fuel Economy and Low Emission

Ajith V Pai, Ramachandra Babu Y, V Lakshminarasimhan, (TVS Motor Company)

20097109

### The Development of Touring Motorcycle with 1352 ml Engine

Hideto Yoshitake, Yuji Horiuchi, Kazunori Miyoshi, Satoru Watabe, Masanori Kinuhata, Hisatoyo Arima, Youichi Utsumi, (Kawasaki Heavy Industries, Ltd.)

20097143

### Developmet of Structure Analysis Method for Motorcycle Frame

Toshiaki Ogushi, Ryota Ide, Yoshihiko Sunayama, (Suzuki Motor Corporation)

## Vehicle Dynamics & Safety

### Organizers:

Takayuki Koizumi, (Doshisha University); Deane B Jaeger, (Harley-Davidson Motor Co.)

20097060

### Cooperative Steer Control on Motorcycle between Rider and Active Support Torque

Yoshiki Noritou, Takayuki Koizumi, Nobutaka Tsujiuchi, Yuya Ezaki, (Doshisha University)

20097081

### Rider Response Time in Motorcycle Riding

Sai Praveen Velagapudi, Raju K. Venkatamanga, R. Babu, (TVS Motor Company Ltd.)

20097146

### Development of an Electronically-Controlled Combined Brake System

Hiroaki Amano, Keiji Sakamoto, Tomoyuki Takahashi, Manabu Kokawa, (Kawasaki Heavy Industries, Ltd.)

20097152

### Simulation and Experimental Study to Improve Wobbling Stability of a 3-Wheeler

Gangi Reddy Dumpala, G. S. G. Ravikanth, Tushar R. Gowade, V. Jeyamuragan, M. Nagarjun Reddy, (TVS Motor Company)





# Currency Exchange Information in Penang

## Currency Exchange facilities

Currency exchange service can be found at the local licensed money changers or banks. They can be found conveniently at airports, all over Georgetown, in shopping malls and hotels.

It is easier to exchange the more popular currencies such as American Dollar, Japanese Yen, European Euro or British Pound although most currencies are accepted. Rates offered at money changers are usually better compared to banks or hotels.

Please remember, the Malaysian currency is not convertible outside Malaysia so make sure to use all your Malaysian ringgit before leaving.

## Denomination of Malaysian ringgit

The Malaysian ringgit comes in notes of RM1, RM5, RM10, RM50 and RM100. There are also coins of 1 sen, 5 sens, 10 sens, 20 sens and 50 sens (100 sens make up 1 ringgit).

## Credit cards, Traveler's Cheque and ATM

**Credits Cards:** Credit cards are widely accepted in larger stores, restaurants and hotels. Some small town shops though will only accept cash

**Traveler's Cheques:** Can be exchanged at the Banks. Western Unions can be exchanged at certain post offices and banks. Some hotels might be willing to exchange Travelers Cheques but the rate may not be attractive.

**ATM Machines:** Many banks provide ATM machines all over Penang which accepts all major credit and debit cards such as Cirrus, Maestro, MasterCard, Visa and JCB. Please note that most ATM imposed certain withdrawal limits between RM 2,000 to RM 3,000 a day.

# Welcome to Penang

## Introduction to Malaysia

From her beginning as a trading port founded by a Sumatran prince in the 13th century, Malaysia had undergone colonization by the Portuguese, Dutch and British before gaining independence in 1957. A nation made up of a federation of 13 states and 3 federal territories, Malaysia achieved tremendous growth since then. Equipped with an educated workforce and modern infrastructures, Malaysia is attracting large foreign investment in the manufacturing, technology and agriculture sectors.

Although a modern country, Malaysia is still blessed with exquisite and diverse flora and fauna. For nature lovers, the National Park is home to the most pristine 130 million years old primary rainforest. Beautiful beaches are also in abundance on islands dotted around the peninsular west coast and east coast. In addition, marine parks and islands off Sabah on the East Malaysia offers one of the world's best diving site.

## Penang

Penang or glamorously known as the Pearl of the Orient is one of Asia's most famous islands which is located north-western of the coast of Peninsular Malaysia. This turtle-shaped island is 293 km sq in area and linked by a breathtaking 13.5 km Penang Bridge to Peninsular Malaysia.

Penang at present is an amalgamated city between the old and the new, a bustling shipping port and serendipity of tropical trees and a heritage city with an industrial free trade zone called "Silicon Valley of the East". Its capital city, Georgetown has garnered large collection of intact pre-war buildings and modern skyscrapers. The white sandy idyllic beaches and those friendly humble natives made up more than a thousand and one reasons to be in Penang.

## Culture and History

Penang was established in 1786 by Captain Francis Light of the British East India Company as the first British trading post in the Far East. He made arrangement to acquire the island from the Sultan of Kedah and built Fort Cornwallis on the north-eastern corner of the island. The fort later became the centre of a growing trading post and swelled the island's population.

Declared as one of the UNESCO World Heritage Sites in 2008, the capital Georgetown is considered a surviving testimony of Penang glorious past. It also reflects the cultural and religious diversity of the place where one can actually see mosques, churches and temples situated side-by-side coexisting peacefully.

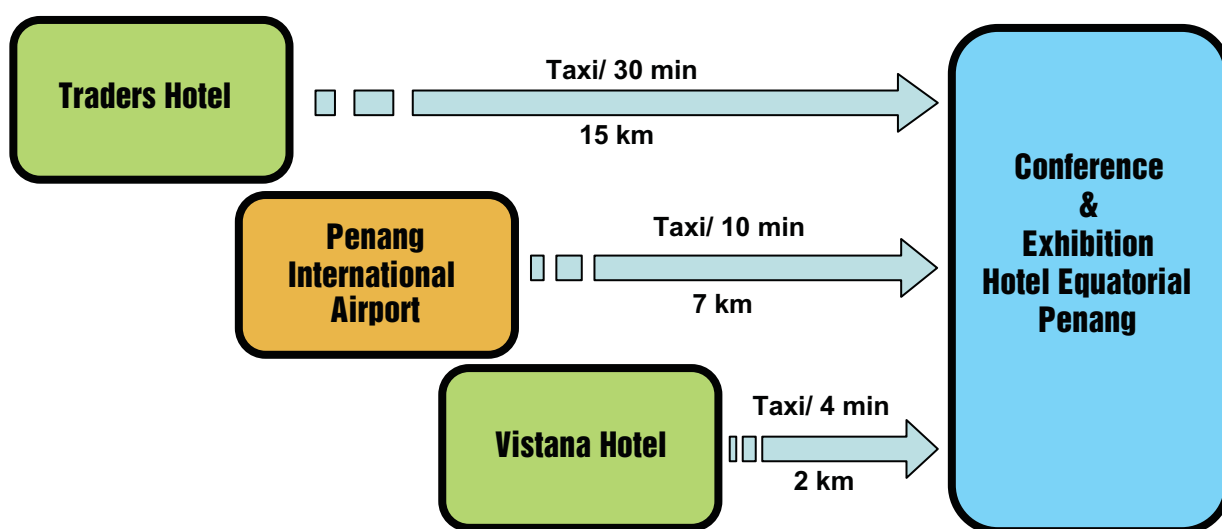


# Travel Information

## Getting to Penang

Penang is easily accessible by air with connections to various international destinations. It is only approximately 55 minutes flight from Kuala Lumpur, and domestic carriers Malaysia Airlines and Air Asia operates frequent flights daily between Kuala Lumpur and Penang. The Penang International Airport is about 7 km from Hotel Equatorial Penang or 20 km from the city centre.

## Access to Conference Venue



## Traveling documentations

Foreign nationals who require a visa to enter Malaysia must apply and obtain the visa in advance at Malaysian Representative Office before entering the country. For the latest and detailed information about visa requirement to enter Malaysia, please refer to official Malaysia Immigration webpage at <http://www.imi.gov.my>

Please note that Malaysia enforce strict law concerning any drugs trafficking offences. Be mindful to disassociate yourself or any of your traveling parties from such activities.



## Climate

Malaysia has an equatorial climate with uniform temperatures throughout the year with the highland areas generally cooler. Temperatures range from 32°C during the day to 22°C at night.

# Travel Information

## Currency



The Malaysian currency is the Ringgit (RM), which is divided into 100 sen. Notes range from RM100 to RM1 and coins are from 50 sen to 5 sen.

## People

Of the 26 million population, Malays who make up about 57% of the population are the predominant group with Chinese, Indians and other ethnic groups making up the rest.



## Religion & Language



Islam is the official religion of the country but all other religions are freely practiced. Bahasa Melayu (Malay) is the national language, English is widely spoken.

## Useful Information

Tourism Penang  
Tourism Malaysia  
Malaysia Airlines  
Air Asia  
Hotel Equatorial Penang

<http://www.tourismpenang.gov.my>  
<http://www.tourismmalaysia.gov.my/>  
<http://www.malaysiaairlines.com>  
<http://www.airasia.com.my>  
<http://www.equatorial.com/pen/>





# Conference Registration

Advanced registration ends on Wednesday, September 16.  
Visit [www.setc2009.com](http://www.setc2009.com) for registration.

## Registration Fee

	Advanced Registration By Wednesday, September 16	On-site Registration After Thursday, September 17
SAE/JSAE Member	US\$510	US\$600
Non Member	US\$600	US\$690
Presenting Author, Session Organizer & Chair	US\$450	US\$540
*Accompanying Person	US\$100	US\$100
**Student (Including Student Presenting Author)	US\$30	US\$30
Media	Free	Free

Malaysian participants are requested to contact the Secretariat for registration.

\*Accompanying person should be the family member of the delegate

\*\*Student and Media registration will require their respective IDs to be faxed to the secretariat in advanced and the original shown at the conference.

## On site Registration Hours

Monday, November 2	14:00 - 18:00
Tuesday, November 3	07:30 - 17:00
Wednesday, November 4	07:30 - 17:00
Thursday, November 5	07:30 - 10:30

## What Does Registration Fee Cover?

	Participant	Accompanying Person
Admission to the Opening and Closing Ceremonies	0	0
Admission to Keynote Speeches and Plenary Session	0	0
Admission to Technical Sessions	0	-
Admission to Exhibition	0	0
Proceedings CD	0	-
Welcome Reception	0	0
Lunches	0	-

## Additional Events

Tickets for these events are not included in the price of registration.

The advanced registration is required for participants.

Banquet: Wednesday, November 4, 18:30 Revolving Restaurant, 16th floor of Bayview Georgetown Hotel

Cost : US\$45

The cost includes transfer fee from and to the Hotel Equatorial Penang.

Register early to take advantage of this opportunity to meet and mingle with the small engine and related products professionals from all over the world.

Technical Visit: Monday, November 2

Cost : US\$45

Details will be forwarded later.

Please contact SETC 2009 Registration Secretariat for:

- Registration for the conference
- Banquet
- Technical Visit
- Visa Supporting Documents

### SETC 2009 Registration Secretariat

c/o  
Armstrong Auto Parts Sdn. Bhd.  
Tikam Batu Industrial Estate,  
08600 Sungai Petani, Kedah Darulaman, MALAYSIA  
TEL: +60-4-438-8202  
FAX: +60-4-438-8626  
Contact person: Ms Zurina Md Isa  
E mail: [zurina@armstrong-auto.com](mailto:zurina@armstrong-auto.com)

# Payment

Advanced registration ends on Wednesday, September 16.

Please pay for the total sum of the registration, the banquet and technical visit, in either way below. You need to proceed with payment after you finish your entry in the online system.

Credit Card	VISA and Master Card are acceptable. Please proceed with online registration.
Bank Transfer (Only applicable for advanced registration, September 16)	Bank account details are as follows :- Bank name : EON Bank Berhad Bank address : Segambut Branch, No 36&38, Jln Segambut Utara, Segambut. 51200 Kuala Lumpur Malaysia Account number : 0072-10-009170-5 SWIFT code : EOBBMYKL Beneficiary : MASAAM-SETC

Note that personal/company cheque is NOT acceptable.

## Cancellation Policy

Cancellation request on the registration, the banquet and the technical visit must be sent by email to the Registration Secretariat.

## Cancellation Charge

If the notification reaches the Secretariat.

Until September 16	10% of the fee
Until October 16	50% of the fee
October 17 onwards	100% of the fee

## Registration Fee

Application Deadline.

Wednesday, September 16 is the application deadline of the advanced registration.  
Application will be processed upon the full payment being confirmed.

Payment

Registration will be completed when we confirm the payment.



# Hotel Information

Individuals are responsible for making their own hotel and travel arrangements. The rates at the following hotels have been negotiated for the convenience of SETC 2009 participants. Please note that rates shown for each hotel exclude applicable taxes.

## Hotel Equatorial Penang



### HOTEL EQUATORIAL PENANG

1 Jalan Bukit Jambul

Bayan Lepas

11900 Penang

Malaysia

Tel: +60 4 643 8111

Fax: +60 4 644 8000

Email: [info@pen.equatorial.com](mailto:info@pen.equatorial.com)

Web: [www.equatorial.com/pen/](http://www.equatorial.com/pen/)

Rating : 5 Star

Set majestically 150 metres above sea level, the island's golf and convention resort is strategically located 5 minutes to the Bayan Lepas Industrial Zone, 7 minutes to the Penang International Airport and 20 minutes to the city centre.

The award winning hotel houses 2 columnless grand ballrooms, one of the largest on the island that can serve up to 2,000 people. There are also 21 other function rooms and an exhibition level that can easily accommodate 240 booths. Combining the flexibility and space options with the hotel's unique ambiance and convenient location, this made the hotel a top choice for businessmen and conference organisers.

Room Type	Rate
Superior room (single)	RM271.00++
Superior room (double)	RM327.00++
Executive room (single)	RM311.00++
Executive room (double)	RM367.00++
Equator room (single)	RM345.00++
Equator room (double)	RM435.00++



# Hotel Information

SETC  
2009

## Vistana Hotel Penang



VISTANA HOTEL PENANG  
213 Jalan Bukit Gambir,  
Bukit Jambul,  
11950 Penang, Malaysia  
Tel : 604 646 8000  
Fax : 604 646 1400  
E-mail : vispg@ytlhotels.com.my  
Web : <http://www.ytlhotels.com/properties/vistana/pg/index.html>  
Rating : 4 Star

Located within the hub of the Free-Industrial-Zone (FIZ), Vistana Penang offers business travellers easy access to major shopping centre such as the popular Bukit Jambul Complex and key roads leading to the famous Bukit Jambul Golf Club and is approximately 10 minutes' car ride from the Penang International Airport.

Room Type	Rate
Single	RM 200.00++
Double	RM 230.00++

## Traders Hotel Penang



TRADERS HOTEL PENANG  
Magazine Road  
10300  
Malaysia  
T: (60 4) 262 2622  
F: (60 4) 262 6526  
Web: <http://www.shangri-la.com/en/property/penang/traders>  
Rating : 5 Star

Traders Hotel, Penang welcomes you to the heart of this fascinating and diverse city. With 443 well-appointed guest rooms and suites, gracious hospitality and outstanding dining options, the hotel serves as an excellent base for exploring Penang Island.

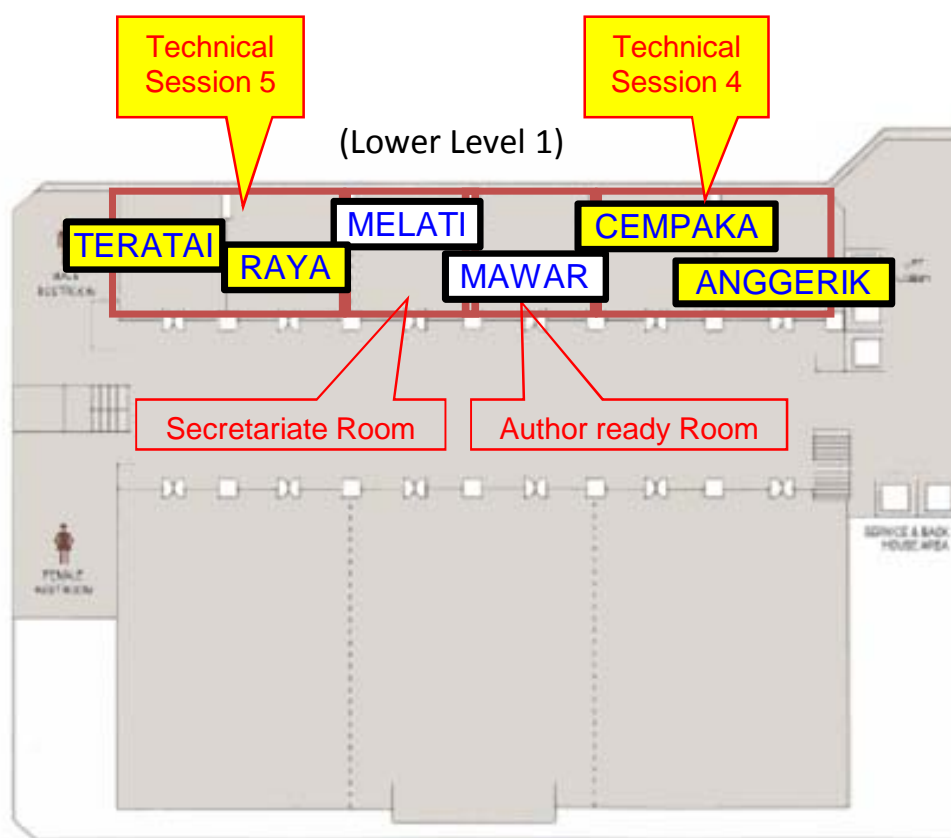
Room Type	Rate
Single	RM 270.00++
Double	RM 295.00++





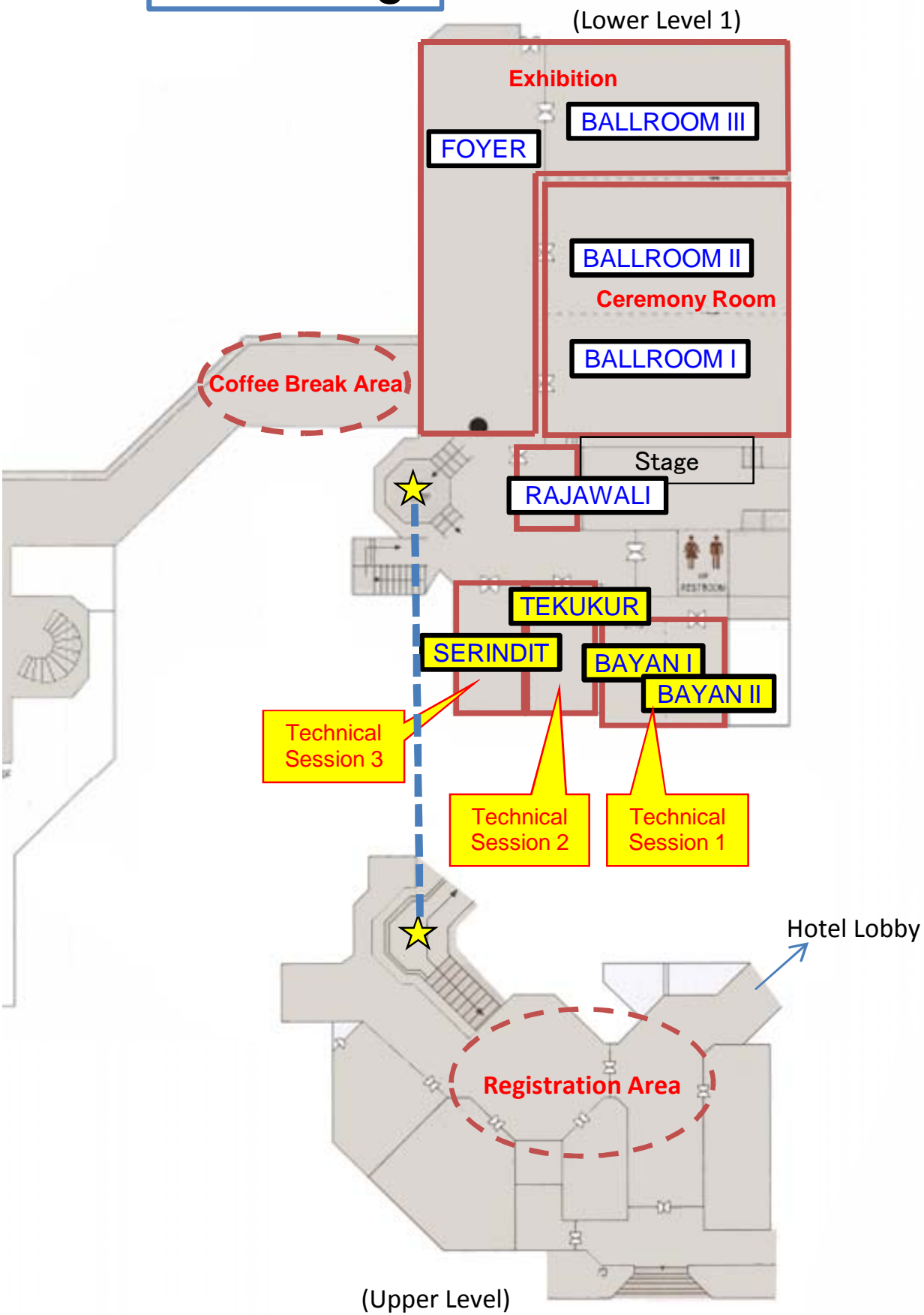
# Floor Guide

## Executive Wing

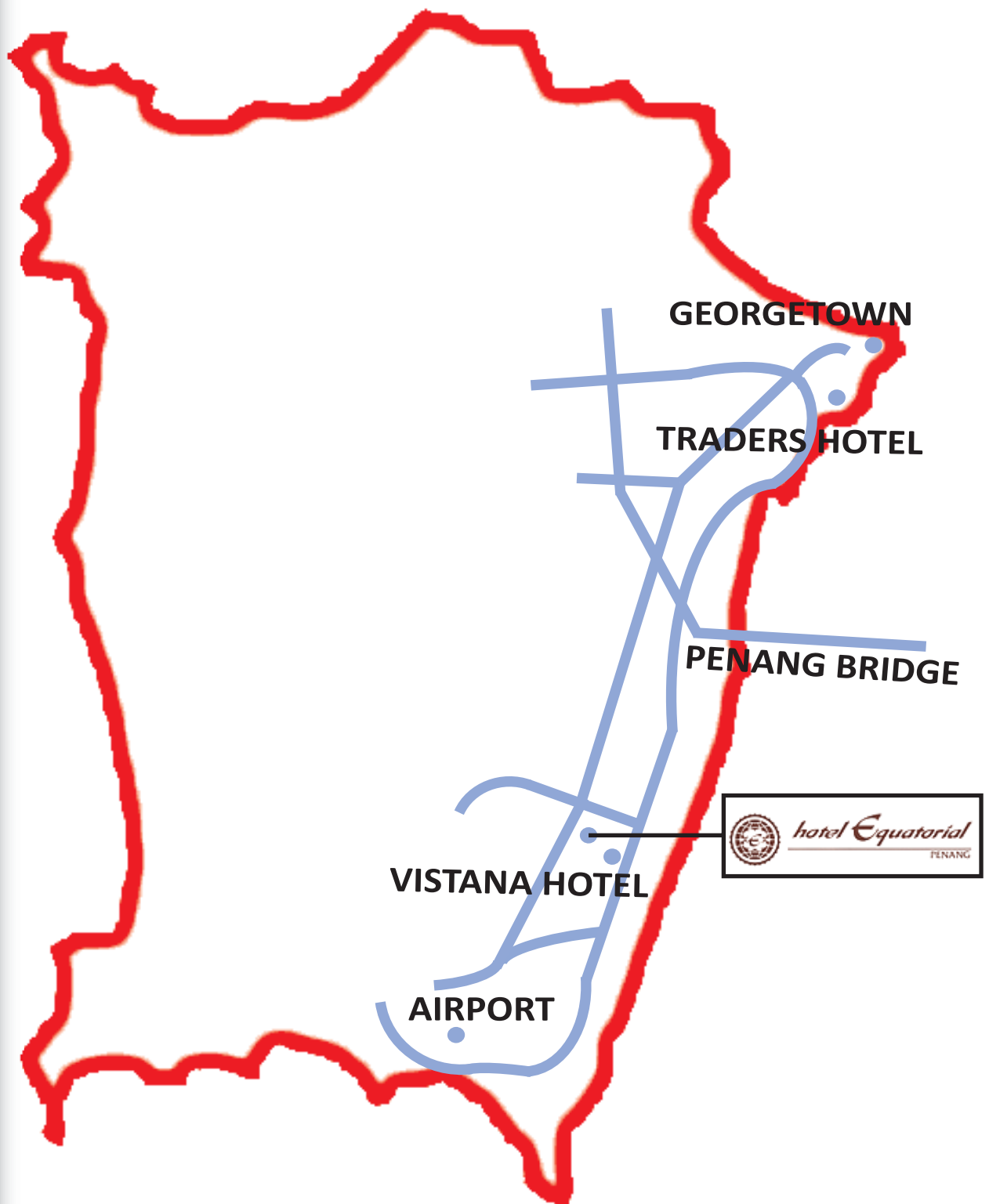


**Lunch room of November 3rd & 4th is "Etoile Restaurant"  
(Ground level of Executive Wing).**

# Main Wing



# Penang Map



# Sponsors

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The Small Engine Technology Conference 2009 organizing committee, JSAE, SAE International and MASAAM, wish to gratefully acknowledge the generous contribution and support of the following companies towards the SETC 2009.



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