

66th International Conference on Mass Properties

May 26-31, 2007

Madrid 



Conference Announcement

Hosted by Central European Chapter



Society of Allied Weight Engineers, Inc.

Non members are welcome

Serving the Aerospace - Shipbuilding - Land Vehicles and Allied Industries

CONFERENCE ANNOUNCEMENT



ERIC PETERSEN
INTERNATIONAL SAWE PRESIDENT
MTS SYSTEMS CORPORATION

I am pleased to invite you to attend the 66th Annual International Conference for the Society of Allied Weight Engineers. The location of this year's conference in Madrid is particularly important because it reflects the growing membership of our organization from locations outside the United States. We are truly an international organization and the Central European host chapter is our largest in terms of membership. The decision to select Madrid as a host city reflects the Society's commitment to reflect our diverse and international membership. We anticipate many new attendees that will bring forth new and unique approaches to mass properties as well as vendors from parts of Europe that have never presented their products and capabilities.

We are first and foremost a technical organization. The Vice President/Technical Director and Government Industry Chairman will lead a committee that will provide a professional forum for an exchange of technical papers, presentations and discussion. In addition, the Vice President/Training and his committee have put together training opportunities that will enhance and further the career paths of our membership.

Our conference will conclude on Wednesday May 30 with an Awards Banquet where we honor those deserving members and chapters that have distinguished themselves by their dedicated service to the society. In addition, we announce the local area scholarship recipient and best paper award for the conference.

The Central European chapter has done a wonderful job organizing a conference that promises to be a new experience in terms of format, technical content and attendance. I look forward to seeing you in beautiful Madrid Spain.



MIGUEL MASCARAY RUFAS
CONFERENCE CO-CHAIRMAN
AIRBUS

JOSÉ MARÍA GUTIERREZ ZUAZUA
CONFERENCE CO-CHAIRMAN
EADS



The European Chapter of SAWE is proud to invite you to the 66th Annual SAWE International Conference on Mass Properties in Madrid (Spain). This historical city, with more than 5 million people, is the capital of Spanish Kingdom placed in the center of the Peninsula Ibérica at the South of Europe. This will bring you the possibility to know very interesting places travelling through Spain and Europe.

The International Conference will be held May 26-31, 2007, at the Meliá Madrid Princesa Hotel. The location of the hotel in Princesa Street will permit you walking by the most emblematic places in Madrid downtown to enjoy the magnificent evening's spring ambient in Madrid.

This year the International Conference is organized by the European Chapter outside from USA which represent for us an honor and, at same time, a big challenge to carry out a successfully Conference. Just from the beginning of our nomination, we wanted to get the success of the Conference looking around three axes: Technical, Social and Financial.

From a Technical point of view we are encouraging to the mass properties worldwide community to make Papers-Presentations. We think that we can offer to the attendance a good quantity and quality of Technical works.

From a Social point of view this Conference gives the opportunity to meet new members or colleagues and to know new companies linked to our professional activity. On the other hand, there are planned some events like a tour to Madrid city and surrounding, visit the "Monastery of El Escorial" build in XVI century during the reign of Philip II. Also there will be a day trip to the nearby cities of Segovia and Toledo where you can appreciate their monuments, art and history.

From a Financial point of view we have a big challenge to cover all the spending without an excessive charge to the attendees. This will be done looking for new sponsors, new exhibitors and minimizing costs.

We would like to thank to the SAWE officers the confidence and help received during these years of preparation to make the Conference a success.

We are aware of our big responsibility to organize this Conference, but we believe that putting together our effort and your participation, all of us will get our purpose: to make the conference a success.

We hope to see you in May in Madrid!



CONFERENCE ANNOUNCEMENT



GERRY TSCHABOLD
INTERNATIONAL VENDOR COORDINATOR
NAVY DEPARTMENT - NAVAL AIR SYSTEMS COMMAND

We expect a large number of exhibitors and sponsors at this year's conference due to its localization in Madrid. Vendor Company representatives will bring conference attendees an awareness of the newest concepts, products, and services offered in all technology areas and transportation sectors. Each exhibitor will have a table or booth in the Exhibit Area(s) at the Hotel Melia Madrid Princesa and may make a brief presentation in one of the Technical Tracks. This year, more than 150 companies will have been extended invitations to participate in our Conference. I, along with the Host Chapter Vendor Chairperson, José María Gutierrez, welcome all new exhibitors, in addition to our regular vendors. Scale and balancing machine manufacturers, composites and advanced materials suppliers, computer software developers, and hardware vendors are expected to attend. You are encouraged to visit these displays and discuss the products and technologies with the attending representatives. Vendor-provided literature, samples, and software demonstrations will be available to take back to work to share with colleagues. Vendors: if interested in participating as a Vendor, Sponsor, or Technical Paper/Presentation Author, please contact me at the following: gerald.tschabold@navy.mil; (301) 342-0216 or (757) 582-5077 (cell).

GOLD SPONSORSHIPS:

- Airbus



SILVER SPONSORSHIPS:

-EADS CASA



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CONFERENCE HOSTS

Werner Sellner	Central European Chapter Director	EADS
Bernard Huber	Central European Chapter President	Airbus
Jan-Ake Bjarkmar	Central European Chapter Vice-President	Saab A/C
Artur Kräutner	Central European Chapter Secretary	Airbus
Miguel Mascaray Rufas	Conference Co-chairman	Airbus
José María Gutierrez Zuazua	Conference Co-chairman	EADS
Rubén González González	Training and Technical Papers Coordinator	Airbus
Elena Adela Surdu	Publicity and International PR, Events and Registration Coordinator	HQ
Tania Cámara Alonso	Webmaster	Airbus
Juan José Hergueta Moyano	Help/Registration Desk	Airbus
Javier García Tenorio	Help/Registration Desk	Airbus

Special Thanks to SAWE UK Chapter members for their support.

TECHNICAL SESSIONS



THOMAS M. SCHULTZ
VICE PRESIDENT - TECHNICAL DIRECTOR
THE BOEING COMPANY

Since its inception in 1939, the purpose of the SAWE has been to promote the exchange of technical information and new ideas in Mass Properties Engineering. The SAWE International Conference is the annual meeting that brings together mass properties professionals from throughout the world. These dedicated men and women work in close cooperation with and address the needs of industry, government, and other engineering and manufacturing organizations. The 2007 Technical Tracks are a result of input from these mass properties professionals with the combined efforts of the International Officers, the 2007 conference committee, and the Technical Committee. We, as engineering professionals, again have the opportunity to learn firsthand about important initiatives, research, and the latest developments in our discipline through specialized technical tracks. Since ours is a community of practicing engineers as well as a unique engineering discipline, this interchange is a special opportunity for all of those who participate. This conference is a forum for individual presentations and panel discussions on applied mass properties technology for the design, manufacturing, testing and utilization of air, land, sea and space vehicles and their associated systems/subsystems. The first and third days of the conference will consist of eight different technical discussion tracks. The supplier exposition again offers all attendees the opportunity to view new products, technology and processes firsthand. This conference is the only one of its kind in the industry and always provides the opportunity for broadened personal contact with other members of the profession and leaders in industry and government(s).

Projected Technical Papers (Updates will be provided at <http://www.madridsawe2007.org> and <http://www.sawe.org>):

- Paper 3401 A Method to Develop a Margin Plan
- Paper 3402 Use of an Aircraft Weighing Accessory Kit for Ship Inclining Experiments.
- Paper 3403 Topology Optimization on the Example of an Advanced Trainer Aircraft
- Paper 3404 Weighing a B747-400 Nose Up to Determine the Vertical Center of Gravity
- Paper 3405 A Methodology of Weight Prediction for Joints in Aircraft
- Paper 3406 Weight Estimation in Preliminary Aircraft Design Using Weight Functions
- Paper 3407 Genetic Algorithms Applied to Weight Optimization
- Paper 3408 Aspect Ratio and Taper Ratio Influence on Empennage Weight
- Paper 3409 Landing Gear Mass Prediction –A Combined Analytic and Parametric Approach
- Paper 3410 Initial Sizing Optimization of Anisotropic Composite Panels with T shape Stiffeners
- Paper 3411 Design Optimization in Aircraft Component Pre-design
- Paper 3412 Influence of Changing Aircraft Masses on Flight and Mission Performance
- Paper 3413 The Influence of Mass Balance on Control Surface Flutter on Combat Aircraft
- Paper 3414 A Reconfigurable Body for Assessing the Uncertainties Related to the Measurement of Inertia Properties
- Paper 3415 How Likely do we Meet Weight Constraints Throughout the Mass Properties Lifecycle?
- Paper 3416 The Affects of Mass Distributions on Flutter
- Paper 3417 Effect of the Variation on the Inertia Properties of a Vehicle Powertrain
- Paper 3418 Development of a Virtual Engineering Model for Global Aircraft Weight Prediction
- Paper 3419 Effect of Unstable Modern Fighter Aircraft Design on Mass Control (an example of the Eurofighter Aircraft)
- Paper 3420 Submarine Equilibrium: Where Weight and Volume Meet
- Paper 3421 Structural Sizing for Weight Estimation in Preliminary Aircraft Design
- Paper 3422 Weight Prediction of UAV-Structures and Subsystems Using Parametric Design Methods
- Paper 3423 Weight Prediction by Use of a Numerical Case-Based Reasoning Approach.
- Paper 3424 Computer-Aided Weight and Cost Management in Vehicle and Aircraft Industry
- Paper 3425 Weight & Balance Control as a Master Integrated Configuration Control System for Large Operators



GOVERNMENT / INDUSTRY WORKSHOPS



JEFFREY A. CERRO
GOVERNMENT/INDUSTRY COMMITTEE CHAIRMAN
NASA LANGLEY RESEARCH CENTER

International Mass Properties Engineers in all disciplines will be very interested in attending this year's Government/Industry workshop. In the United States SAWE is the professional society chosen to take on the responsibilities for maintenance and growth of U.S. based Mass Properties standards. Through our International cooperation and application of "Open" standards development practices, newly developed SAWE standards should be acceptable as international standards. Join us in our workshops to discuss progress in the creation of these new Mass Properties Standards and Recommended Practices. Last years conference succeeded in producing a Recommended Practice document hierarchy which at the top has a single document to describe Mass Properties Engineering (MPE) tasks. This document then indicates eight more documents of both technical and managerial nature and together these nine documents describe the Functional aspects of Mass Properties Engineering, the general tasks which occur for all transportation modes. Detailed MPE standards and Recommended Practices will be referenced from these top level documents. Come and hear the status of our systems engineering level and our detail level standards activities. The Society's development of a Marine Engineering Mass Properties textbook is a major accomplishment to be reviewed as well. Speaker topics will also include current European issues in the implementation of MPE standards. SAWE hopes to see many contributors and generally interested participants at this year's G/I meeting. Vendors, please note that the definition of an "open" standards development process means your ideas, participation, and contributions are of primary importance to the creation of modern standards.

Government/Industry Day Summary of Events

Joint Session:

Traditionally SAWE G/I day (Tuesday) has largely been defined by U.S. activities related to that regions particular standards and best practice documents. By meeting in Spain this year, it is our opportunity to gain greater insight into the European and General International communities use and development of MPE best practices. With this prime consideration in mind a full G/I day joint session is planned. Topics of discussion for this large workshop format meeting include:

- European development, utilization, and maintenance of MPE standards for the transportation sectors of:
 - Marine
 - Aerospace
 - Ground Vehicle
- SAWE Functional Recommended Practice standards development
- The future of MPE considering E-standards and OOP techniques
- The status of SAWE textbooks and handbooks
- Development of the new SAWE website
- Yearly status of the SAWE G/I committees

Transportation Sector Breakout Sessions:

SAWE International Conference meetings traditionally include separate meetings for each of our transportation sector groups:

- Marine Systems
- Airline Affairs
- Military Aircraft
- Missiles and Space Systems
- Ground Systems

Meeting time and space is again being set aside on Tuesday so that breakout sessions can be held for each of these groups. Any meeting participant interested in attending a breakout session is welcome to participate and gain more in-depth knowledge of that group's activities. Breakout sessions are scheduled in 2 hours blocks.

Government/Industry Luncheon:

The Government/Industry luncheon is an exceptional opportunity to attend a talk given by a distinguished government or industry representative. The presentation will be of general interest to all conference participants and is traditionally a technically and socially entertaining event. All conference participants have the option of attending Tuesday's Luncheon.

Attendees Note: If you have questions or comments regarding this years G/I activities please contact us at the email addresses (jeffrey.a.cerro@nasa.gov or jose.g.gutierrez@eads.com).

TRAINING PROGRAM



ANDY SCHUSTER
VICE PRESIDENT - TRAINING AND HR
NORTHROP GRUMMAN NEWPORT NEWS



At the 66th Annual Conference, we offer the following classes for your professional development. The classes are offered to expand your expertise as a Mass Properties Engineer (MPE), so we hope that SAWE members will take classes in fields other than their own area of expertise or industry. Especially for the European community, and new for 2007, we have arranged a series of half-day classes on Tuesday to introduce members to marine and aircraft MPE best practices. The classes consist of lectures, exercises, and discussion. Each student will receive a copy of the training materials and a certificate upon completion. Some classes require that students bring their own laptop.

Airline Operational CG Curtailment Guidelines

Instructor: Tony Kiscellus, American Airlines, Dallas, Texas

The instructor has tailored this one-day class especially for SAWE to address weight and balance aspects of airline operations. His perspective as an airline dispatcher with everyday experience makes this course material very attractive to mass properties engineering. The course's principals and approaches are applicable across industry and product fields. Students learn about the technical practices needed to ensure safe balance criteria in the highly dynamic conditions of airline operations. Students should bring a laptop with MS Excel to the class.

Automated Weight and Balance System (AWBS) Software Training

Instructor: Steve Kross, retired USAF, Las Vegas, Nevada

The one-day class will present all the new features of the Version 9.2 of the U.S. Air Force's Automated Weight and Balance Software in a hands-on training class. The class will begin with a discussion of terms, history of AWBS development, minimum system requirements, and installing and uninstalling the software. The basic approach of the class is to give computer demonstrations followed by student exercises that will provide the students with a good understanding of features of AWBS Version 9.2. Students will receive a complete overview of software features to support weight control program for military aircraft. The instructor will also allow time to address specific AWBS needs and questions of the students. Students are required to bring their laptop computer, with a licensed copy of AWBS installed on it to the class.

Airline Weight and Balance Operations

Instructor: Tony Kiscellus, American Airlines, Dallas, Texas

This one-day class will discuss weight and balance topics as they relate to Airline Operations. A majority of class time will be spent covering airline procedures for developing and controlling weight and balance for aircraft fleets as well as individual flight operations. The class will address the development and application of computerized weight and balance systems used by the largest airlines and development and application of localized manual weight and balance systems used by some regional carriers. Discussions will include a comparison of the two systems. Air Transport Association (ATA) standards and applicable Federal Aviation Regulations (FAR) will be reviewed, as well as how airlines comply with these rules. The class will provide a step-by-step demonstration and explanation of how an airline prepares for introduction of a new aircraft into service and the dynamics of how limitations are applied and interpreted to maximize the revenue potential of each aircraft type. We will also cover statistical analysis and substantiation of average weights airlines use for passengers and baggage. This class is intended to provide the students with an understanding of weight and balance concepts and their application to airline operations.

Measuring Mass Properties

Instructor: Wayne Clay, Lockheed Martin, Fort Worth, Texas

This full day class will include classroom discussion and laboratory exercises on how to measure mass, center of gravity, Mass Moment of Inertia (MOI), and then calculate the Product of Inertia (POI). The classroom work will include fixture design, torsion pendulum calibration, MOI measurement, Bifilar Pendulum measurement, simple methods to calculate MOI and POI, and Radius of Gyration. The laboratory exercises will include measuring and determining MOI and POI using a torsion pendulum, bifilar pendulum, and a modern tabletop spin balance machine. The instructor will bring steel frame pendulums, and a vendor has graciously volunteered to loan us a spin balance machine for the laboratory work. The class is intended as a refresher and introductory class for anyone interested in seriously measuring all Mass Properties of an object.

Airline Fleet Weights versus Individual Weight Programs

Instructor: Tony Kiscellus, American Airlines, Dallas, Texas

This half day class will review the rules (as revised by AC120-27D) associated with operating under fleet weights and individual weights. A comparison of procedures and a review of pros and cons for each concept will be conducted. We will also review the intricacies of individual weight and CG tracking, establishing fleet weights and unaccountable growth application, and fleet weighing scheduling. Examples describing the process will also be provided to help with establishing a method for inclusion in an operator's FAA approved Weight and Balance Program.



Marine Systems Weight Estimating Methods - Based on SAWE RP 14

Instructor: Andy Schuster, SAWE Fellow, of Northrop Grumman Newport News Virginia,

This half-day class will cover the fundamental methods of estimating the weight for marine system and some practical. The class will review weight estimating methods described in SAWE Recommended Practice 14 “Marine Weight Estimating and Margin Policy Guideline,” followed by practical examples. The class will cover the theory, and application of these methods on specific examples and for whole ship design. The students will develop a ship weight estimate for a 200-foot ship.

Helicopter Preliminary Design

Instructor: Luis Lucero, SAWE Honorary Fellow, Retired from The Boeing Company

This full day class is intended to provide an understanding of the helicopter and how it flies and how to create a weight estimate of a helicopter. This will be done using a lecture and a class exercise. The lecture topics include: Review the steps necessary to arrive at a mission definition. Develop of top-level requirements to achieve the stated mission. Create of an initial weight estimate and refining it as the design develops. Discuss the basics for estimating power and fuel requirements for a design. Discuss basic flight controls and performance. The class exercise will be to size a rotor, provide an inboard profile sketch and performance estimates. It will be assumed that we are launching a new design to fit a given mission requirement.

Principals of Mass Properties Management & Control for Military Aircraft – SAWE RP 07

Instructors: Dudley Cate, SAWE Fellow, formerly, Head of NAVAIR Mass Properties Group

This is full day class will familiarize students with effective control of the weight and the other mass properties of an aircraft. The class will also expose students to other considerations associated with mass properties management and control described in SAWERP-07. The primary objective will be to acquaint participants with the major considerations for successful weight control during the development phases of a program: concept exploration, demonstration/validation and full-scale development. Those major elements include planning, organizing, staffing, subcontractor control, requirements allocation, risk reduction, data collection, analysis, tracking, controlling, weight reduction programs, validation, verification and test support.

Marine Weight Control – based on SAWE RP 12 & 14

Instructors: Mark Redmond, SAWE Fellow - Manager Naval Architecture Alion Corp

This half day class will focused on marine One on Weight Control The Weight Control portion will progress from an in-depth review of the fundamentals of Weight Control, through how to identify weight margins for Naval surface ships, ending with a presentation on Submarine weight control and stability. The processes covered in the class include how and when weight estimates are prepared; how design and building weight margins are established; and how to track weight trends. The class will describe the appropriate weight control for the life cycle of the ship from early stage design through deactivation for ships under typical NAVSEA cognizance.

Structural Analysis/Optimization

Instructor: Brett L. Anderson, P.E., SAWE Fellow, The Boeing Company

This is a full day class that covers structural design and analysis considerations and their impact on Mass Properties. This course is for working engineers outside of the Stress or Loads organization to provide insight into the decision tools and processes affecting structural integrity. Specific emphasis will be given to identify and explain the typical methods utilized by Structural Analyst and how these can sometimes adversely affect the optimization of the structure. Illustration of several accepted practices and their impact will be covered in the case studies. This course will also provide public domain strength and material related references including but not limited too: FAA Metallic Materials Properties Development and Standardization (MMPD) This document also represents the last version of the Mil Hdbk 5 ref., release MIL-HNDBK-5J.

Exhibitor Technology Classes

Instructor: Various

These 2-hour classes are intended to provide MPEs a more detailed briefing about new technology and industry overviews that can not be covered in a technical papers. We hope to have several “Exhibitor Technology Classes” or overviews from various industries at the conference. We are working with exhibitors to provide classes on ship design software exhibitor, composite materials, mass measurement, and a regulatory body. If you plan to exhibit at the Madrid conference and would like to teach a short professional class on the technology of your industry, please contact us.

SAWE International/Chapter Officer or Committee Chairman Orientation

Instructors: Andy Schuster, SAWE VP – Training, and Eric Peterson, SAWE President, both SAWE Fellows

This is a two-hour introduction to familiarize new leaders of the society with SAWE organization and processes. The class will summarize the SAWE By-Laws and Operations Manual in a concise manner to give the student a overview of their responsibilities and duties. The course will cover the financial, organizational, and technical organizations of the society.

How to develop a product for SAWE

Instructors: Andy Schuster, VP – Training and SAWE Fellow, with Jerry Pierson, Senior VP and SAWE Honorary Fellow,

This is a two-hour will discuss how SAWE Members can develop papers, best practices, new sections to the handbook, software tools and other documents. The class is intended for those interested in making a contribution to the profession MPE profession.



SPECIAL TOURS AND EVENTS

Sunday, May 27

Madrid Tour

See tourist sights from a dedicated bus with explanation of the history and special characteristics of the most important places in Madrid. The cost is 15 € per person.

Opening Reception (Sunday Night Event)

The traditional welcome reception will be held in the Sabatini Room at the Hotel Melia Madrid Princesa. This will be a great opportunity to renew old acquaintances and make some new ones. “Vino español” will be served. Please join us at 6:00 pm for this gathering. The cost is 25 € per person.

Monday, May 28

Royal Palace and Historic Madrid

Visit to the Royal Palace dependences (guided) including the Throne Hall and the Royal Armoury (with an all centuries exposition), Shopping time on the way back to the Hotel. The cost is 30 € per person.



Reception at Town Hall by Mayor and Dinner with Spanish Spectacle

The city of Madrid brings us the opportunity to be welcomed by the Mayor at Town Hall in order to thank The Society of Allied Weight Engineers for locating the International Conference in Madrid. After this, we will go to dinner to a special “andaluz” restaurant (in the south of Spain) where we could taste typical Spanish dishes (ham, omelet...) at the same time we show a flamenco spectacle. The cost is 50 € per person.



Tuesday, May 29

Visit to Segovia

Segovia, an old city at 90 Km. from Madrid, we will visit the “Acueducto” (water conduit) built by Romans 2000 years ago, the Castle “Alcazar” and the Gothic Cathedral. Segovia, whose old town and Roman aqueduct are World Heritage, is located on high ground between the channels of the rivers Eresma and Clamores. In addition to the famous Aqueduct, a multitude of medieval churches, the Cathedral and Alcazar fortress make up a majestic landscape, which dominates these Castilian lands. Its modern Parador is one of the best places for travelers to try the city's most typical dish: roast suckling pig. Segovia is also an excellent starting point for travelling through the province and visiting the palace of La Granja or the Natural Park of las Hoces del Río Duratón, among other options. The cost is 60 € per person.



Government/Industry Luncheon

The Government/Industry luncheon will feature a prominent guest speaker from the aeronautics industry. While final arrangements are currently underway, we can expect a lively presentation relevant to current military aircraft programs. The Government/Industry luncheon is included with a full three-day registration or vendor registration. The cost is 40 € for all others. The luncheon starts at noon in the Sabatini Room.

Wednesday, May 30

Visit to Toledo

Toledo is a very interesting city at 70 Km from Madrid. Toledo, with over two thousand years of history, has the special characteristic of being a melting pot where all the cultures and eras of Spain have come together and intermingled. Together it makes up a small but rich example of the history of the land. It was the intellectual and cultural centre in the 12th and 13th centuries and Cradle of the Mudéjar style. It was the capital of the empire under Carlos I and the capital city of the Spanish church. See the refuge and inspiration of El Greco. Their cultural influences, together with the tolerance and adaptability of its inhabitants, have made the entire city a monument, composed of innumerable buildings, fine examples of a pluralistic culture, where palaces and convents have been built with a mixture of granite masonry, Visigothic remains and Muslim filigree plasterwork. The cost is 60 € per person.



Awards Banquet (Wednesday Night Event)

The Awards Banquet will be held in the Sabatini Room at the Hotel Melia Madrid Princesa at 9:00 pm preceded by a reception with “vino español” at 8:00 pm. Cost is 55 € per person.

Thursday, May 31

Special Historical-Technological Tour

This special tour will be in two parts; in the morning, the visit to Spanish facilities of ESA/NASA in Robledo de Chavela and, in the afternoon, the visit to historical monastery of El Escorial. The cost is 60 € per person.

Visit to Madrid Deep Space Communication Complex (MDSCC-NASA)

The Visitors Centre (CEV) of Robledo de Chavela was opened in 2002, co-financed by NASA, INTA and INSA. The foundation objectives of CEV are:

- Spreading of knowledge related to space science and technology
- Technical training on space activities.
- Promotion of space and science among schools and universities
- Conferences on space issues
- Monographs of launches and key milestones in space missions



The Visitors Centre is located inside a modern building at the entrance of Madrid Deep Space Communications Centre (MDSCC), in the municipality of Robledo de Chavela (Madrid). The Visitors Centre has the following facilities:

- Exhibition Hall 1: mock-ups, graphics and instruments used in manned flights, about the history and functions of MDSCC and about the different centres that compose the Deep Space Network (Madrid, Canberra and California).
- Exhibition Hall 2: it gathers information about space missions and the several planets that compose the solar system. In this exhibition, one can see a 1/1 mock-up of the space vehicle that got to Mars in January 2004 (MER).
- Exhibition Hall 3: It is composed of spacecraft and rockets mock-ups, as well as of several elements used in manned space missions, such as –for instance- astronauts suits like the one used by NASA’s astronaut Miguel López Alegría.
- Video Screening Room: Used to project videos and make presentations and conferences on space topics related to MDSCC and the DSN.

Visit to El Escorial

The Monastery of El Escorial, located some 30 miles northwest of Madrid in the foothills of the Sierra de Guadarrama, was built as a monument to commemorate the Spanish victory over the French in the battle of Saint Quentin on 10 August 1557 (feast day of St. Lawrence). Felipe II himself selected the site for the monastery, 1,028 meters (3,372 feet) above sea level, and personally oversaw the progress of the project. Architect Juan Bautista de Toledo initially designed the monastery, but after his death in 1567, his assistant Juan de Herrera continued the work. Construction lasted 21 years from 1563 to 1584, and for many years after its completion, El Escorial Monastery was the largest building in the world.



The building is structured around a main axis that extends eastwards from the main façade through the Library, the Kings' Courtyard, the Basilica, and the Palace of Felipe II. In addition, the complex includes a Monastery, a Seminary, a School, and the Kings' Pantheon beneath the high altar of the Basilica. The decoration of the Monastery was entrusted to prominent Italian painters of the time who were responsible for the Gallery of Battles and the Library among other rooms. Works of Titian, Bosch, El Greco, and Velázquez also hang in the Chapter Rooms and Sacristy. Overall there are about 1,600 paintings and more than 500 frescoes in walls and ceilings. The Monastery has an interesting Museum of Painting and Architecture as well.

Organization Committee additional recommendation:

Explore Madrid and Spain on your own

Madrid is modern, cosmopolitan European city with world-renown museums, churches, cultural sites and dining. You can easily get around the city using the subway (1Euro/trip), cheap taxis, or for visits to nearby cities like Toledo by frequently scheduled trains. Pick up a travel guidebook at your local bookstore or library to find out what might be of interest and to plan your own side trips before, during or after the conference.

CONFERENCE GENERAL SCHEDULE

Saturday 26 th	Sunday 27th	Monday 28th	Tuesday 29th	Wednesday 30th	Thursday 31th
Training	Training	Opening Session	Training	Training	
Training	Training	Training	Opening Session	Training	
	Board of Directors	Integrated Product Design	Aerospace/Marine/Ground Utilization, Creation and Maintenance of Standards Influence of other Ind. and Society activities on SAWE	Advanced Design Characterization	Special Historical Technological Tour
		Marine Systems Design		System Verification	
		Ground Systems Design		Mass Properties Life Cycle Management	
		Flight Technology		Flight Technology	
Training	Training	Training	G/I Luncheon	Advanced Design Characterization	
	Board of Directors	Integrated Product Design	Training	System Verification	Special Historical Technological Tour
		Marine Systems Design	Functional and Product Recommended Practice Status	Mass Properties Life Cycle Management	
		Ground Systems Design		Flight Technology	
		Flight Technology			
	Conference Reception	Reception at Town Hall Special Dinner		Open Input from the General Membership	AWARDS Reception
				AWARDS Banquet	

SPOUSES EVENTS GENERAL SCHEDULE

Sunday 27th	Monday 28th	Tuesday 29th	Wednesday 30th
Madrid Tour	Visit to Royal Palace and Historical Madrid (XVII century)	Visit to Segovia	Visit to Toledo



GENERAL INFORMATION

LOCATION

The 66th Annual International Conference will be held at the Hotel Melia Madrid Princesa in Madrid, Spain.

ACCOMODATIONS

Hotel Melia Madrid Princesa
Princesa 27
28029 Madrid, Spain

Phone: (34) 91 5418200

Fax: (34) 91 5411988

Web site: http://www.solmelia.com/solNew/hoteles/jsp/C_Hotel_Description.jsp?codigoHotel=2803

Rates: 170€/night (double room), 170€/night (single room) plus 7% room tax

Dead line for reservation: 25th April 2007. Ones the room blockage is covered, all reserves will be confirmed according to the availability of the hotel

ADVANCED TRAINING REGISTRATION

Training Fee is 250 € per full day class, 125 € per half day class and 20 € per vendor class. Students must pay a full registration for the day of the class (Monday to Wednesday) and weekend classes requires at least one-day registration. SAWE membership is required for all students. Advance registration by April 25, 2007 is expected but not required. Class sizes are limited and enrollment is subject to availability. SAWE reserves the right to cancel or merge classes if registration does not meet the minimum standards for student interaction.

ADVANCED CONFERENCE REGISTRATION

All those attending the conference technical sessions or training must register and receive conference credentials. Advance registration is advised and offers special discounted rates. Registration fees for 2007 are as follows:

3 Day – Members (including G/I Luncheon)	475 €
2 Day – Members*	350 €
1 Day – Members*	175 €
3 Day – Retired Members & Students*	30 €
2 Day – Retired Members & Students*	20 €
1 Day – Retired Members & Students*	10 €

*(No G/I luncheon included)

LATE FEES

A late fee of 50 € will be charged for those registering after the April 25, 2007 deadline.

NON-MEMBER FEES

A fee of 100 € will be charged for non-members to attend the conference. SAWE suggests you instead purchase a membership at 50 \$ (which includes a 5 \$ enrollment fee) or a membership with the Society's Weight Engineer's Handbook on CD-ROM for 75 \$. Membership is 45 \$ per year thereafter.

SPECIAL EVENTS

Reservations for ticketed/special events will not be made unless payment in full accompanies the order. All tickets and/or receipts will be held at the Conference Registration desk. Special events are detailed with this conference announcement.

INQUIRIES

Inquiries about the SAWE should be made to the Executive Director at:

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