# Society of Allied Weight Engineers, Inc.

*Aerospace • Marine • Offshore • Land • Allied Industries*

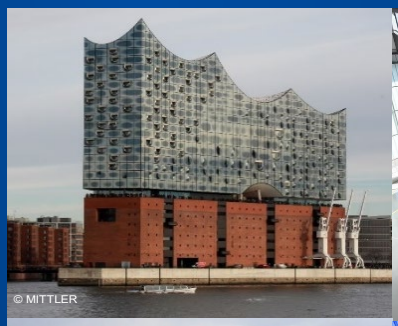


## WELCOMES MEMBERS, INDUSTRY & ACADEMICS TO THE

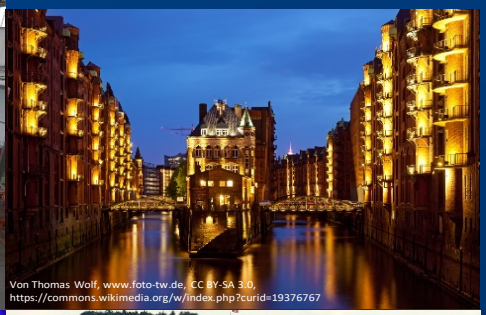
# 79TH INTERNATIONAL CONFERENCE ON MASS PROPERTIES ENGINEERING

MAY 23rd – 28th , 2020
www.sawe.org

HAMBURG, GERMANY
Privathotel Lindtner










John Hargrave
International SAWE President
Northrop Grumman, Retired

On behalf of the Society of Allied Weight Engineers I want to extend a cordial invitation to our 79th Annual International Conference being held in Hamburg, Germany. Our conference host committee have planned an exciting event line up of opportunities for you to:

• Learn about today's latest technologies, techniques, and programs •
• Participate in mass properties specialty training courses •
• Participate in development and updates of mass properties industry standards •
• Experience problem solving in forum discussions •
• Meet vendor representatives and get acquainted with products essential to our jobs •
• Talk informally with customers, competitors, and suppliers •
• Review development of the new Mass Properties Engineer Certification program •
• Learn first-hand about the latest SAWE activities and programs •

SAWE's technical sessions, training courses, standards and practices workshops, and forum discussions address the many needs across the military aircraft, commercial aircraft, airline, space, marine, offshore, land vehicles, and allied industries represented by our society.

The conference is designed to enhance your knowledge and capabilities in a technical, comfortable, and fun atmosphere. Mass Properties Engineering has many dynamic influences that have become increasingly important. Factors such as new challenges due to changes such as technologies, materials, manufacturing, design to cost, and significant impending workforce attrition make these opportunities even more important for companies to sponsor your participation.

Attendance at our conference will be rewarded with a valuable experience renewing your understanding of mass properties and improving your abilities to generate top performance products in a safe, efficient manner.

Make plans now to join us in Hamburg!

If you need guidance for discussing conference attendance with your sponsoring management visit our website at: https://www.sawe.org/conferences/conferencetips

Kim Mittler
Airbus Commercial
Conference Co-Chair

Werner Sellner
Sellner Aerostructure
Conference Co-Chair

The Society of Allied Weight Engineers' Central European Chapter is proud to host and welcome you to the 79th Annual International Conference on Mass Properties Engineering in Hamburg, Germany. This is the fourth time the Central European Chapter has hosted this International Conference for professionals in industry and students and faculty in universities.

We have planned two days of Technical Sessions with strong technical content in weight management including but not limited to weight estimation, calculation, growth, optimization and uncertainty. We have devoted one day to Standards and Practice Development with industry workshops to aide in discussions and planning for revision or new industry standard development. Preceding the conference as well as during the technical program, we are offering our popular Training Classes, including aircraft of the future, parametric weight methods, weight estimating, structural optimization, weight management and validation. You will benefit from our industry experts' papers, presentations, and training along with the student's research to future-proof your competence in mass properties engineering.

Our conference venue is the Hotel "Privathotel Lindtner", a facility which combines an excellent conference service with an approachable ambience and excellent cuisine. The hotel is located south of Hamburg in a forested area and is well connected to the City center. You will be pleasantly surprised with the astonishing buffets you will be served.

Don't miss the opportunity to visit Hamburg. Hamburg has been recognized by magazines and newspapers as one of the most livable and least stressful cities in the world. Hamburg is a city of contrasts with both historic and new buildings, a harbor with historic undercurrents amid its modern façade and is a center of research. In Hamburg, you find a huge diversity of culture such as shopping malls next to relaxing water places. Like the Central European Chapter, you will love it.

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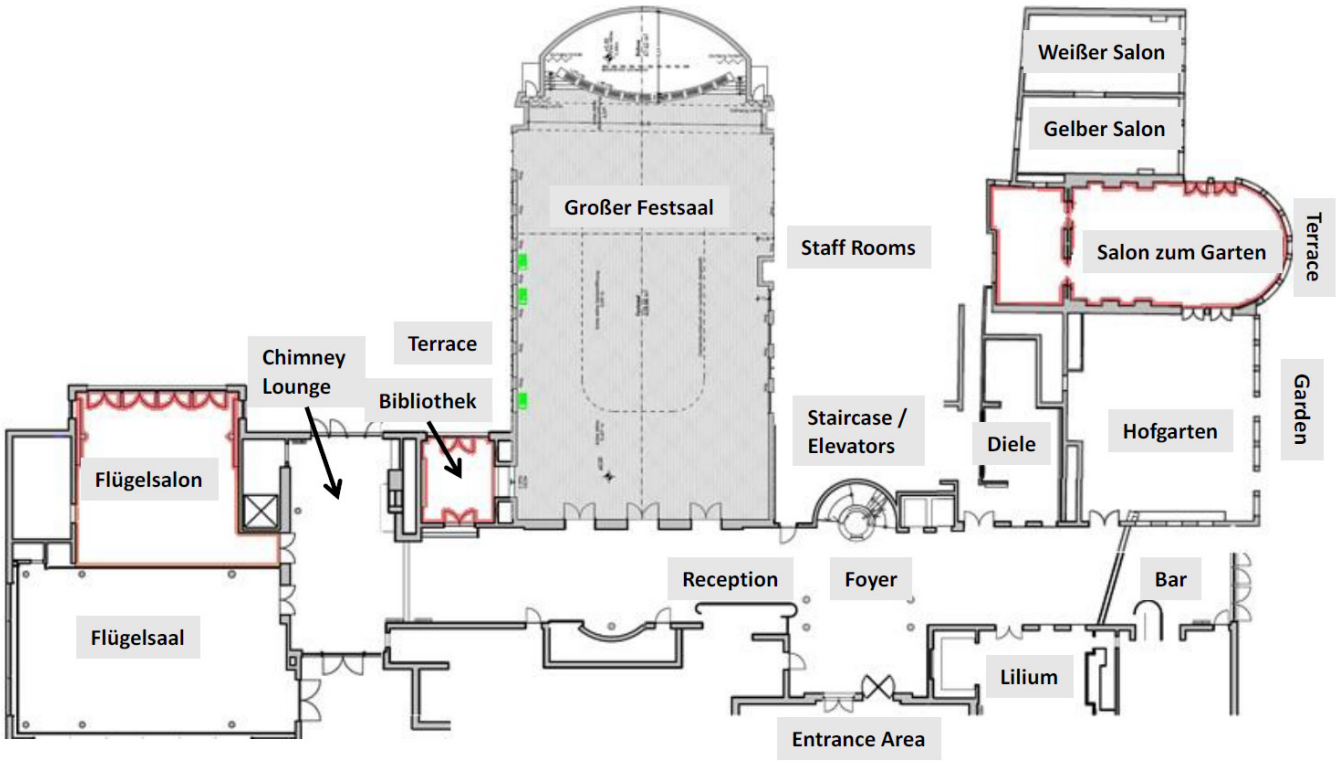
# Privathotel Lindtner Layout



# Vendors and Sponsors

Paul Kennedy (U.S)
VP Vendor Relations
Space Electronics LLC
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Jose M Gutierrez Zuazua (Spain)
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jose.g.guiterrez@airbus.com

The Vendor Relations Team is pleased to invite your company to participate as an exhibitor at the 79th SAWE International Conference on Mass Properties Engineering in Hamburg, Germany. During our three-day conference, exhibitors will have the opportunity to present their new concepts, products and services to experts and decision makers in the weight engineering realm. Exhibitors will enjoy a 3m x 3m booth space in our exhibit hall along with the following:

EXHIBITOR BENEFITS

- Company name listed in the conference program
- Two 3-day complimentary registrations for company representatives
- Opportunity to give a company presentation during one of our technical sessions
- Promotional and advertising opportunities to help increase your company's exposure
- Complimentary delivery of exhibit materials to the exhibit hall on "Setup Sunday"*
  * Large shipping containers may be subject to handling fees by the conference facility
- Complimentary crate storage during the conference
- Draped display table with chairs
- Electrical service – standard 220V/50 Hz
- Opportunity to provide training in the use of your product
- Following the event, all exhibitors will receive a list of conference attendees

Early registration for the conference is encouraged. Space is limited, so claim your spot by registering today! For more information and a link to online registration, visit us at: www.sawe.org/conferences/intl20/sponsorship.

For further assistance, please contact a member of our Vendor Relations Team.

We look forward to seeing you in Hamburg!

# Supporting Organizations

AEROSPACE

Corporate Partner

LOCKHEED MARTIN

Corporate Partner

AIRBUS

Corporate Partner
Conference Sponsor

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Intercomp advanced weighing technology . . . by any measure

Corporate Partner
EXHIBITOR

Interested in becoming an Exhibitor or a Conference Sponsor?
Contact the Vendor Relations Team for details!

# Technical Tracks

Robert Zimmerman
VP Technical Director
Lockheed Martin - Retired

Werner Massinger
Deputy VP Technical Director
Airbus D & S

Werner Sellner
Deputy VP Technical Director
Sellner Aerostructures

John Nakai
Deputy VP Technical Director
The Aerospace Corporation

The Society of Allied Weight Engineers has been promoting the exchange of technical information about Mass Properties Engineering since 1939. As we enter our 79th year of holding International Conferences, the SAWE welcomes those engineers who have created new technical information to exchange, and those who will participate in our 79th Annual Conference on Mass Properties Engineering to learn about these technical advances. The SAWE brings mass properties professionals from all around the world to partake in a meaningful interchange of ideas, culminating in two days of technical tracks on various aspects of mass properties.

The annual SAWE conference is an opportunity for mass properties professionals to interact and share information that is vital to excellence in mass properties execution. Plan on attending the technical sessions with the attendant paper presentations and meet your colleagues from literally around the world.

The 2020 Conference technical sessions will include topics ranging from Mass Properties Statistics to mass properties measurement, in two complete days of papers, presentations, and what is fast becoming an SAWE tradition, the Technical Forum. This year's Forum will focus on "The Importance of Statistics in Mass Properties"

Some of the papers planned for the conference:

3709 A WING WEIGHT ESTIMATION METHOD BASED ON WING-BOX BEAM DESIGN
Bai Lu, COMAC

3731 AIRCRAFT GROWTH PROGNOSTICS
McKenzie Turpin, Naval Warfare Center

3732 CLASS II & 1/2 MASS ESTIMATION OF LIGHT AIRCRAFT COMPOSITE WINGS
Miguel Nuno & Kai-Uwe Schroeder, Rheinisch-Westfaelische Technische Hochschule Aachen

3733 OBTAINING MASS PROPERTIES OF EXTERNAL FUEL TANKS USING CATIA V5 AUTOMATION
José Maria Gutierrez Zuazua, Juan M. Abellan, Martin de la Cruz, & José Carlos, Airbus

3734 DYNAMIC COMPUTER SIMULATION OF AIRCRAFT BUOYANCY
Peter Stubbers, Gulfstream

3735 WEIGHT AND BALANCE CHALLENGES FOR HYBRID ELECTRIC PROPULSION SYSTEM
Vera de Paul & Dr. Florian Vogel, Airbus

3736 HYDROGEN FUEL CELL POWER SYSTEM WEIGHT CHALLENGES IN VTOL AIRCRAFT
Joseph Rainville & Greg Ray, Bell

3737 USE OF MASS GROWTH ALLOWANCE TO DYNAMICALLY MANAGE MASS RISK
Zaid Karajeh, Maxar

3738 AFT PERPENDICULAR... AN AFTER-THOUGHT
Robert Dvorak, Scott Daley, & Matt Marburger, NAVSEA

3739 ROTORCRAFT MASS ASSESSMENT IN AN INTEGRATED DESIGN FRAMEWORK
Dominick B. Schwinn & Peter Weiand, DLR

S3740 EVALUATION AND ANALYSIS OF APPLYING A MBSE APPROACH FOR OPTIMIZING MASS PROPERTIES PARAMETERS IN COMMERCIAL AIRCRAFT DESIGN
Manfred Josefsson, Inholland University of Applied Sciences Delft

3741 FINDING THE BALANCE BETWEEN ACCURACY AND PRACTICALITY IN DEADWEIGHT AUDITS
Manuela Bucci & Colin MacFarland, Tymor Marine

3742 LONG RANGE AIRCRAFT MAXIMUM ZERO FUEL WEIGHT FUSELAGE SHEAR CURVE DESIGN FOR AVOIDING AIRLINE CUMULATIVE SHEAR CHECKS
Ruben Gonzalez & Jorge Antonio Bes-Torres, Airbus

S3743 FVA 30: STRUCTURAL DESIGN OF A TOURING MOTOR GLIDER USING PROBABILISTIC MASS ESTIMATION METHODS
Matthias Konersmann, M. Nuno M. Schmidt, S. Neveling, M. Scholjegerdes, F. Diekmann, B. Kelm, & T. Moxter, Rheinisch-Westfaelische Technische Hochschule Aachen

S3744 ENERGY TRANSITION DRIVING SUSTAINABLE AVIATION; WHAT IS THE IMPACT ON WEIGHT AND BALANCE WHEN CONVERTING EXISTING AIR PLANES TO ELECTRIC PROPULSION?
Mark Ommert, Arnold Koetje, Randy van Ruijven, Inholland University of Applied Sciences Delft

3745 WEIGHT MANAGEMENT FOR ON-SHORE MODULES
Robert Hundl, Fluor

S3746 UNDERSTANDING THE AIRCRAFT MASS GROWTH AND REDUCTION FACTOR
John Singh Cheema and Dieter Scholz, Hamburg University of Applied Sciences

3747 CFRP DENSITY UNCERTAINTIES
Jeorg Eichhorn, Airbus

S3748 INVESTIGATION OF AN ON-BOARD WEIGHT AND BALANCE SYSTEM FOR A HELICOPTER EQUIPPED WITH SKID LANDING GEAR
Christian Elischer, Airbus Helicopter

S3749 ONE FITS ALL? A COMPARISON OF WEIGHT ESTIMATION METHODS FOR PRELIMINARY AIRCRAFT DESIGN
Andreas Gobbin & Arthur Kluender, Technical University of Berlin

3750 FOLDING WINGS - BENEFITS IN AIRCRAFT DESIGN DESPITE LOCAL MASS INCREASE
Dieter Scholz, Hamburg University of Applied Sciences

3751 DEVELOPMENT OF THE SAWE MASS PROPERTIES CERTIFICATION PROGRAM
Andy Schuster, Retired

3752 A PORTABLE DEVICE FOR MEASURING THE COG: DESIGN, ERROR ANALYSIS AND CALIBRATION
Giorgio Previati, Massimilio Gobbi, & Federico Ballo, University di Milano

3753 THEORETICAL AND EXPERIMENTAL EVALUATION OF THE FLEXIBILITY OF THE TEST RIG ON INERTIA PROPERTY MEASUREMENT
Giorgio Previati, Massimilio Gobbi, & Gianpiero Mastinu, University di Milano

## Expected Papers (Paper Numbers TBD)

TBD FUTURE WEIGHT ACCOUNTING SYSTEMS
To Be Confirmed, Airbus

TBD WEIGHT DATA EXCHANGE
To Be Confirmed,, Airbus

TBD CHALLENGES IN WRITING "MEANS OF COMPLIANCE" TO SUPPORT LEAN AIRCRAFT CERTIFICATION PROCESSES ACCORDING FAR-23/CS-23 AND FAR-27/CS-27 - A PROGRESS REPORT FROM THE WORKING GROUP AIRPLANE CERTIFICATION (WGAC)
Joerg Heublisch, Larry Liceicz, and Simaon Waite, DLR/FAA/EASA

TBD FIRST GAINED EXPERIENCE IN MASS ESTIMATION OF A SOLAR-POWERED HALE-AIRCRAFT
Joerg Heublisch, Larry Liceicz, and Simaon Waite, DLR/FAA/EASA

TBD STRATEGIES FOR THE COMPOSITE STIFFENED PANEL TOPOLOGY OPTIMIZATION FOR MINIMUM WEIGHT
J. Ali Elham, Technical University Braunschweig

TBD RESISTANCE TESTS WITH 3D MODELS PRINTED IN THE EARLY SHIP DESIGN OF HIGH SPEED VESSELS
Robin Kloske, Technische Universität Hamburg

TBD IN-SERVICE WEIGHT CONTROL METHODS
Andreas Schuster, retired

# SAWE Forums

The SAWE is proud to present two forums this year:

## INITIATIVE FORUM
## Weight Management of Mission Specific Operational Variable Items and its Impact on Flight Planning

Moderators: Daniel Bonfante, Miguel Mascaray

We will open this year's forum sessions with a forum we hope will bring together Worldwide Airlines, Regulators, Authoritites, and Aircraft Manufacturers. This Initiative Forum will discuss:

- Mission specific variable items to be considered
- Payload weight management
- Uncertainties management
- Better management
- Effect on fuel planning
- Effect on performance
- Effect on loadability

## TECHNICAL FORUM
## The Importance of Statistics in Mass Properties

Moderators: Robert Zimmerman, VP Technical Director, Lockheed Martin (retired)
Manuela Bucci, Tymor Marine

For this year's Technical Forum, we will discuss the importance of a thorough understanding of statistics and their use throughout mass properties, from initial estimation through bounding of measured mass properties. With the advent of statistical control methods for manufacturing efficiencies and the expanding use of automation in operation of vehicles, knowing the range of values of any particular mass property has taken on renewed urgency in the 21st Century. As a result, mass properties engineers are expected to be fluent in statistical methods and calculations to ensure that the end product meets specification and usability requirements.

Following a presentation that will serve as an impetus for further discussion, the floor will be opened for a lively discussion of any and all aspects of statistics in mass properties.

# Conference General Schedule

| | Saturday May 23 | Sunday May 24 | Monday May 25 | Tuesday May 26 | Wednesday May 27 | Thursday May 28 |
|---|---|---|---|---|---|---|
| Morning | Training<br><br>BOD Meeting (by invitation) | Training | Training<br><br>Technical Tracks | Training<br><br>Standards and Practices Joint Session & Work-shops | Training<br><br>Technical Tracks | Shipweight User Group Meeting |
| Afternoon | | | | Standards and Practices Luncheon, Afternoon Work-shops | | |
| Evening | | | Welcome Reception | German Theme Dinner | Awards Banquet | Travel |

Note: 3-day conference registration covers conference attendance on Monday, Tuesday, and Wednesday. See Pages 23 - 26 for registration details.

## Inquiries

All inquires about the SAWE organization, including membership and sponsorship, should be made to:

William Boze
Executive Director
Society of Allied Weight Engineers, Inc.
bill.boze@sawe.org

All inquires about the SAWE 2020 International Conference should be made to:

Conference Co-Chair: Kim Mittler
Phone: +49 4074377918
Email: kim.mittler@airbus.com

# Opening Session Speaker

## Marc Fischer
## Head of Flight Physics
## Senior Vice President, Engineering, Airbus


Marc Fischer is a Senior Vice President within the Airbus Group, and has been leading the Airbus Flight Physics Center of Competence (EG) since November 2014.

The Center provides flight physics solutions to all Airbus products and is part of the overall aircraft design community and the Engineering function. Flight Physics employs 750 engineers across 6 sites and consists of seven domains, covering: Aerodynamics, Loads & Aeroelastics, Aircraft Performance, Mass Properties, Flight Dynamics Simulation, Policy, Development & Integration, and Business Transformation & Strategy.

Prior to his current role, Marc held various positions within the Loads & Aeroelastics Domain, including the posts of Head of Domain (2012-2014), and Head of Component Loads & Systems Support (2010-2012).

Originally, Marc joined Airbus as a structural engineer within the Structural Analysis department (2003-2005), which was followed by the positions of Executive Technical Assistant to the EVP Engineering (2006-2008) and A380 Assistant Chief Engineer (2008-2009).

Marc holds a Master of Engineering (MEng (Hons)) degree and PhD from Cardiff University, United Kingdom, as well as a Master of Business Administration (MBA) from the College des Ingénieurs (CDI), Paris, France.

Having grown up at the border between Germany and France, Marc has developed a strong interest in foreign languages, and speaks German, French, English and Spanish. He is 43 years old and currently lives near Toulouse, Midi-Pyrenees, France.

# Standards and Practices Day

Doug Fisher
VP Standards and Practices
Collins Aerospace

SAWE supports mass properties professionals and their customers by making available products such as Recommended Practices, textbooks and handbooks. The Standards and Practices committee provides a non-proprietary, consensus forum for developing these products which make our professional activities more efficient, more consistent, and more valuable to the professionals of today and tomorrow, as well as more understandable to our customers.

This effort is so important that an entire day – Tuesday, May 26th - is dedicated to it. All are invited to attend and learn more, make your voice heard, and get involved.

The day will begin with a review of the year's progress and future objectives. Then the industry committees will meet in separate break-out sessions for most of the morning. The Standards and Practices luncheon will feature a keynote speaker. After lunch the industry committees will return to their break-out sessions before reconvening at the end of the day for a short debrief of their day's accomplishments to all.

Six industry committees encompass the breadth of SAWE activities. Each industry committee will meet in a separate break-out session for most of the day. During this time, industry needs and opportunities are reviewed, past progress is reviewed and future activities are planned. Committees may use the forum to brainstorm or build consensus on a particularly challenging issue. This is also the opportunity to elect committee chairs for the next year.

Airline Affairs – focused on aircraft loading and performance for commercial airline operations; includes commercial aircraft product development
Ground Vehicles – private, commercial, government and military cars, trucks, motorcycles, off-road vehicles, construction equipment and trains
Marine – private, commercial, government and military surface vessels; submarines
Military Aircraft – military fixed wing, rotary wing and lighter-than-air vehicles; includes remotely piloted aircraft; includes applications on private and commercial aircraft
Missiles & Space - commercial, government and military missiles, launch vehicles and spacecraft
Offshore – fixed base, floating and semi-submersible platforms primarily for commercial petroleum exploration, drilling and production

The Standards and Practices committee invites all members and visitors to participate and help us improve our profession. You are not required to register for a break-out session. You are not required to join the session that matches your industry, and you are not required to stay all day in one session – you may choose to join one session in the morning and another in the afternoon. We welcome new ideas, new participants and new contributions. This is your opportunity to make your voice heard.

## Standards and Practices Luncheon Speaker

# CHECK BACK FOR MORE INFO

# CONFERENCE ANNOUNCEMENT WILL BE UPDATED ONCE SPEAKER IS FINALIZED

# Training Program

Dan Rowley
Vice President - Training
Northrop Grumman Corporation

Dirk Petersen
Conference Training Coordinator
Airbus Operations GmbH

The Society of Allied Weight Engineers Training Committee invites you to the 79th Annual International Conference on Mass Properties in Hamburg, Germany, and is pleased to offer you a variety of classes for your professional development. The classes are offered to expand your expertise as a Mass Properties Engineer, and we hope that many of you will register for classes outside of your area of expertise or industry to broaden your technical capabilities. After taking these classes, you will emerge more knowledgeable and learn how special the discipline of weight engineering is across multiple industries.

The Training Program will take place at Privathotel Lindtner, Hamburg, Germany from May 23 through May 27, 2020. Some classes include hands-on sessions at off-site locations nearby.

SAWE Training is excited to offer two new classes: Vendor Weight Control and Structural Weight Optimization for Mass Properties Engineers.

The SAWE has a long-proven track record of delivering outstanding training, and we hope that you will enjoy training with us here in Hamburg.

## Designing the Aircraft of the Future

Miguel Mascaray-Rufas - SAWE Honorary Fellow -Airbus Commercial

This two day class presents the principles of weight engineering in new aircraft design as described in the SAWE Aircraft Weight Engineering Textbook.

Course topics include: requirements development, aircraft performance, conceptual aircraft design weight estimates & optimization, weight trades, engine selection, vendor weight selection, establishing target weights, operational weight, preliminary design studies, detail design and database management.

Students attending the class will receive a copy of the Aircraft Weight Engineering Textbook.

## Structural Weight Optimization for Mass Properties Engineers

Michael Wawrzniek - Altair

This course will enable Mass Properties Engineers to identify and realize weight reduction opportunities through application of finite element analysis based structural optimization. The course will cover the topics key to successful application of structural optimization which include (i) fundamentals of finite element analysis, (ii) fundamentals of structural optimization, (iii) identification of optimization opportunities, (iv) formulation of structural optimization problem, (v) design interpretation, (vi) design validation, and (vii) practical engineering aspects of structural optimization. Classroom instructions on these topics will be consolidated using hands-on exercises.

## Aircraft Weight & Balance Course

Tom Oole – SAWE Honorary Fellow – United States Air Force – Retired

This two-day course assumes a basic knowledge of weight and balance. The class will demonstrate and teach proper procedures for weighing and completing forms for military aircraft. The intent of this class is to provide the student with an understanding of the weight and balance system within the United States Air Force and "pitfalls" involved in weighing aircraft.

The general principles of this course are also applicable to commercial aircraft as well as to aircraft major subsections.

Students should bring basic calculators, paper, and pens/pencils for use in examples and exercises. Students should also dress appropriately for the trip to the aircraft hangar. Wear rubber-soled, closed-toed shoes.

## Vendor Weight Control

Whidy Kiskunas – SAWE Fellow – Collins Aerospace

This one-day class will discuss the various items included in RP100 Vendor Weight Control for the Aircraft Industry as well as RP 15/M-4 Vendor Weight Control for the Marine Industry. These two RPs share many common requirements from vendors, although some of the acronyms and definition may vary the data request is of a similar nature. The course will cover the major sections of the two RPs. Examples of what sort of data that is required in these sections will be presented followed by in class discussion on these section. Classroom discussion will provide a means to ask specific questions that may address problems or clarification of requirements.

Topics that will be covered are: Introduction and purpose, Equipment and Supply Chain, Weight Control, Mass Properties requirements, Weight Reduction programs, Actual weighing and verification, and weight reporting. Other topics may be discussed time permitting.

The goal of this course is to introduce you to vendor weight control, detail the different phases and types of deliverables you may be required and also provide guidance on how to achieve these requirements.

## Ship Inclining

William Fox, P.E. – SAWE Honorary Fellow – Retired

This full day class will discuss the inclining of a vessel in order to determine its displacement (weight) and center of gravity. The primary emphasis will be on inclining in water, but inclining in air will also be covered. A classroom session on the theory, procedure, and results of inclining will be held, followed by an actual demonstration of inclining techniques aboard a waterborne vessel.

The objectives of the class are to provide the student with an introduction to the principles of naval architecture and marine terminology, and to discuss and demonstrate the inclining of a vessel to determine its weight and center of gravity. ASTM F 1321-90, standard Guide for Conducting a Stability Test, will be used as a text for this class. After a brief introduction to the principles of naval architecture, the theory and purpose of the inclining experiment will be presented. The light ship survey will be described and then the inclining experiment itself will be discussed. Preparations required aboard the vessel and ashore will be described, and plans and equipment required will be discussed and demonstrated. Inclining procedures, data, and calculations will be reviewed, and examples from an actual inclining will be examined in detail. Troubleshooting the results of the inclining, and matters of bias and accuracy, will be covered. Inclining of a small vessel in air will be discussed.

Following the classroom session, the class will travel to and board a vessel for a practical demonstration of an inclining. A brief light ship survey will be completed, drafts and specific gravity of the water will be taken, and inclining weight will be moved to obtain a plot of tangents and inclining moments. The resulting data will be processed, and the vessel's light ship displacement and center of gravity will be determined at the conclusion. After the inclining, the class will have lunch at a local restaurant or on board the vessel, then will return to the hotel for a summary and closing. The class will conclude with a short open-book test and exercise to confirm that the student has gained an understanding of the theory and practice of inclining a vessel. A conference room at the hotel will be provided, as well as transportation to and from the inclining site.

Basic calculators will be needed for examples and exercises. Students should wear casual clothes and rubber-soled shoes, as they will be boarding a vessel.

## Marine Vehicle Weight Estimating Methodology

David Hansch – SAWE Fellow - Huntington Ingalls Industry

This is a full day class discussing the fundamentals of marine vehicle weight estimating. A review of the weight estimating methods described in SAWE Recommended Practice 14 "Marine Weight Estimating & Margin Policy Guideline". The class will cover the theory, and application of these methods on specific examples and for whole ship design. The appropriateness of each method for each stage of ship design, construction and operation will be discussed. The students will work examples to estimate the weight of a vessel using multiple methods. Historic examples of weight estimating errors will be discussed as an example of practices to be avoided. Classroom materials and exercises will be provided. Students should have reviewed Chapter 24 in the Weight Engineers Handbook, and SAWE RP 14 found on the SAWE website.

## Automated Weight and Balance System (AWBS) Software Training

Harold Smoot – SAWE Fellow – Lockheed Martin

This one-day class will present the features of the Automated Weight and Balance System in a hands-on software training class. The class will include explanations of the charts and forms (Chart A, Form B, Chart C, and Form F) explained in RP7 to maintain proper operational weight and balance of military aircraft. The basic approach of the class is to give computer demonstrations followed by student exercises that provide the students with a good understanding of AWBS Version 10.0 features and capabilities. The instructor will also address students' specific AWBS questions. All students are required to bring their own laptop computer running Microsoft Windows with AWBS 10.0 installed.

## Developing Basic Parametric Methods

Georg Garbers – SAWE Member – Airbus Operations GmbH

The course will cover such topics as Basic Statistical Terminology, Statistical Correlation Processes, Parametric Estimation Pitfalls, and a Parametric Fighter Aircraft Wing Weight Correlation example.

Above photo: Von Viola sonans - Eigenes Werk, CC BY-SA 4.0

| Training Classes for May 2020 | | |
|---|---|---|
| Class | Day | Instructor |
| Designing the Aircraft of the Future (TWO DAYS) | Saturday, May 23 - Sunday, May 24 | Miguel Mascaray-Rufas |
| Ship Inclining | Saturday, May 23 | Bill Fox |
| Structural Optimization for Mass Properties Engineers | Sunday, May 24 | Michael Wawrzniek |
| Aircraft Weight and Balance (TWO DAYS) | Monday, May 25 - Tuesday, May 26 | Tom Oole |
| Marine Weight Control and Management | Monday, May 25 | David Hansch |
| Vendor Weight Control | Tuesday, May 26 | Whidy Kiskunas |
| AWBS (Automated Weight and Balance System) | Wednesday, May 27 | Harold Smoot |
| Developing Basic Parametric Methods | Wednesday, May 27 | Georg Garbers |

All training class attendees will receive a course completion certificate with the appropriate Professional Development Hours (PDH). This is being done in order to assist trainees in satisfying any necessary professional development requirements that they must meet.

See Page 26 for Training Registration Fees.

# Central European Chapter Officers

| Position | Name | Affiliation |
|---|---|---|
| President | Miguel Angel Mascaray-Rufas | Airbus Commercial |
| Vice-President | Uwe Kueper | Retired |
| Treasurer | Werner Sellner | Sellner Aerostructure |
| Director | Werner Sellner | Sellner Aerostructure |

The Central European chapter membership is comprised of about 90 engineers who are involved with weight engineering /mass properties in the design and construction of aircraft, ships, in universities and in the operation of aicraft in airlines.

Our Chapter, includes members from from Spain, Turkey, Italy, Sweden, Germany, France, Netherlands,... the different European Cultures are present . This enriches us : the more the diversity of our cultures, the greatest the technical contents of our Chapter.

# 79th International Conference Host Committee
# Central European Chapter

| Position | Names | Affiliation |
|---|---|---|
| Co-Chairs | Kim Mittler<br>Werner Sellner | Airbus Commercial<br>Sellner Aerostructure |
| Budget/Finance | Kim Mittler | Airbus Commercial |
| Technical Papers | Miguel Mascaray-Rufas | Airbus Commercial |
| Student Coordinator | Mathias Haake<br>Georg Garbers<br>Johann "Hans" Wenzl | Airbus Commercial<br>Airbus Commercial<br>Airbus Helicopters |
| Training Coordinator | Dirk Petersen | Airbus Commercial |
| Exhibitor Coordinator | Jose-Maria Gutierrez-Zuazua<br>Claudia Rosenberger | Airbus Defense and Space<br>USB |
| Facilities | Roland Fuhrmann<br>Tim Richters | Airbus Commercial<br>Airbus Commercial |
| Photography | Rached Ouafi | Airbus Commercial |
| Events Coordinator | Michael Doliva | Airbus Commercial |
| Marketing/Publicity | Laura Bethge-Meyer | Airbus Commercial |
| Announcement and Program | Ruben Gonzalez-Gonzalez<br>Melissa Gray, Kittyhawk Chapter | Airbus Commercial<br>United States Air Force |
| Registration | Sebastian Herda<br>Greg Ray, Texas Chapter | Airbus Commercial<br>Bell |

# Privathotel Lindtner Hamburg

Heimfelder Str. 123, 21075 Hamburg Germany
Phone: +49 40 790090

## Transportation

The Privathotel Lindtner does not offer a shuttle service between the Hamburg International Airport and the hotel.

Attendees are encouraged to use one of the transportation options listed below to travel from the airport to the conference location.

Public transport
- Most convenient is public transportation that includes bus, tram, Subway, ferry and train
- Within the Hamburg limits all day will cost 6 euro/ 29 euro for the week.
- Very useful would be the HVV app that will show you the way https://www.hvv.de/en

Drive yourself
Our advice is to get familiar with German regulations in advance. Useful link:
http://www.gettingaroundgermany.info/autobahn.shtml

For your safety in Hamburg: Dial 112 Fire & Emergency, and 110 Police

Hamburg has a lot to offer, the following page allows individual planning, including prices and booking options:
http://www.hamburg-citytours.de/en/

# General Conference Registration

Registration for the "Technical Conference" for 1,2, or 3 days is required for everyone attending or participating in any of the Technical Sessions (Monday, May 25th and Wednesday, May 27th) and/or Standards and Practices (SnP) Day (Tuesday, May 26th). Non-members must pay an additional fee to attend the Technical Sessions and/or the SnP Day. Only by registering can you obtain a Conference Badge, which is required for admittance to these events.

Those people that are doing training only, only pay for training. Members and Non-members are welcome to our hotel events, including the Welcome Reception, German Theme Dinner, Awards Banquet, and any of the day tours planned, by signing up for "events only."

Online registration in advance of arrival is strongly advised. Payment of all applicable registration fees must be paid in full prior to or at the time of obtaining your badge and conference materials at registration. The preferred method of payment is by credit card. If you need to provide an invoice to your employer for business travel approval, registration may be completed with a billable invoice for later payment. All invoices must be paid in full prior to the start of the conference. Settlement of invoices must be done by coordinating with the conference host registration chairperson. Instructions for paying invoices are provided during registration check out and on the invoice. There are NO exceptions to this, including exhibitor representatives. Admittance to the conference events will only be allowed to registered attendees with full, complete, and verified payment.

General Registration fees are shown in the table below. For Students, Retirees, Authors, and Presenters, please see the fees identified under the Special Conference Registration section on page 24. Registration should be conducted online at www.sawe.org.

| Registration Level | Fee (USD) | Conference Papers |
|---|---|---|
| SAWE Members | | |
| 3-day Registration | $950 | Free |
| 2-day Registration | $650 | $100 |
| 1-day Registration | $350 | $100 |
| Non-SAWE Members | | |
| 3-day Registration | $1050 | Free |
| 2-day Registration | $750 | $100 |
| 1-day Registration | $450 | $100 |

For the 2020 Conference in Hamburg, the hotel restaurant and event staff are requesting accurate headcount in advance for all SAWE meal events.

General conference registration will include lunch service and coffee/snack service during session breaks. Evening dinner events will require a separate purchased ticket. These can be purchased as individual dinner tickets or as a 3-day ticket for a small discount. These dinner events are optional but encouraged to attend unless you are leaving the hotel property.

Alternate restaurant and dining options away from the hotel location will require ground transportation. Ordering lunch or dinner at the hotel restaurant as an individual table will require additional time for the restaurant staff to prepare. Page 24 goes into further detail on prices of all meals.

# Special Conference Registration and Prepaid Meal Options

Full-time students, retirees, authors of SAWE conference papers, and conference presenters (who do not submit an associated paper for the presentation) are all eligible for Special Conference Registration fees or discounts. Please note that all registration fees must be paid in full prior to or at the time you obtain your badge and conference materials at registration. There are NO exceptions to this. Registration should be conducted online at www.sawe.org.

The Society of Allied Weight Engineers takes pride in its strong network building facilitated by offering pre-arranged evening events including our Welcome Reception, German Theme Dinner, and Awards Banquet.

| Special Registration Category | Registration Fee (USD) |
|---|---|
| Retirees | |
| Full Time Retiree | $180 |
| Students Not Presenting a Paper | |
| Students | $100 |
| Authors and Presenters | |
| Author (non-Student) | Complimentary 1-day registration on day paper is presented for one individual per paper only |
| Student Author | Complimentary 3-day registration for all authors or co-authors |
| Presenter (without SAWE Paper Submittal) | Complimentary 1-day registration for day of presentation |
| | |
| Guest | See Evening Dinner Events and Special Event pricing |
| Board of Directors Meeting (Invite Only) | $35 (includes lunch) |
| ShipWeight User Group Meeting | $175 |

The Hotel Lindtner restaurants have excellent quisine. Since the hotel location lacks nearby convenient restaurant choices, we have arranged for 3-course menu selections for your convenience and to improve meal service.

| Evening Dinner Events | Fee (USD) |
|---|---|
| All Registrants and Guests | |
| 3-days: Monday, Tuesday, Wednesday | $125 |
| Monday Only: Welcome Barbeque | $50 |
| Tuesday Only: German Theme Dinner | $50 |
| Wednesday Only: Awards Banquet | $50 |

| Pre/Post Conference Optional Meals | Fee (USD) |
|---|---|
| All Registrants and Guests | |
| Friday, May 22, LUNCH | $50 |
| Friday, May 22, DINNER | $50 |
| Saturday, May 23, LUNCH | $50 |
| Saturday, May 23, DINNER | $50 |
| Thursday, May 28, LUNCH | $50 |

# Important Registration Information

1. All registrations conducted after May 3, 2020 will incur a $100 Late Charge over the previously listed fees. We therefore encourage all parties to pre-register prior to this date, even if your company has not yet authorized your attendance or you know you will be paying your fees upon arrival at the conference instead of at the time of registration. There is a fee to refund on a credit card and is dependent on the card used.

2. All qualifying registered attendees will be granted access to all SAWE papers presented at the conference by means of a password and link to allow access to them electronically. The links will be forwarded to the attendance list shortly after the conference. 1 and 2-day registrants may purchase access to all conference papers for $100. As a benefit of SAWE membership, members have access to conference papers one year after the date of the conference session.

3. Non-SAWE members registering for the conference automatically incur a $100 non-member fee. Since current SAWE membership dues are $60/year (or $30 for new members for the 1st year), consideration should be made to becoming an SAWE member at registration instead.

# Training Registration

Two-day class:.....$1,200 USD
Full-day class:..... $600 USD
Lunches included for day(s) of class(es)

Course registrations must be completed no later than May 3, 2020 to ensure your seat in the class, and to allow for pre-planning by the instructor and preparation of sufficient class materials. Exceptions will be considered ONLY if class space remains after the cutoff date. Class sizes are limited, and enrollment is subject to availability. The SAWE reserves the right to cancel or combine classes if enrollment does not meet the minimum requirements.

Registration Fees must be paid in full prior to the beginning of the class of which the Trainee is registered. No Trainee will be allowed admittance into the class if Registration Fees are not paid in full.

Above photo, Copyright: Airbus / Michael Lindner

ShipWeight™

# ShipWeight User Group Meeting

The 14th ShipWeight User Group meeting will be held on Thursday, May 28, 2020, in conjunction with the 79th SAWE International Conference on Mass Properties Engineering (May 23-28, 2020 in Hamburg, Germany). The meeting will be of interest to active ShipWeight users as well as those who are considering acquiring it.

The meeting is also an opportunity to meet other ShipWeight users in an informal setting for exchanging experiences and discussions on best practices. Last, but not least, it is a great opportunity to provide feedback to the developers of ShipWeight and participate in making priorities for future development of the software.

## Key Information

| | |
|---|---|
| Where | Privathotel Lindtner, Hamburg, Germany |
| When | Thursday, May 28, from 8:30 – 4:30 PM |
| Registration | Through the web at www.sawe.org, or by email office@shipweight.com |
| Cost | $175 - Includes lunch and refreshments |
| Registration deadline | Per SAWE General Conference Registration |

## ShipWeight User Meeting – Tentative Schedule
## May 28, 2020

| | |
|---|---|
| 8.30 am – 8.35 am | Welcome |
| 8.35 am – 9.00 am | Parametric estimation |
| 9.00 am – 9.30 am | Estimation of local CoG |
| 9.30 am – 10.00 am | Using ShipWeight “Cloud” for lightship estimates |
| 10.00 am – 10.30 am | Coffee break |
| 10.30 am – 11.00 am | Using “Source” option for the weight groups |
| 11.00 am – 11.30 am | 3D visualization of the weight model |
| 11.30 am – 12.00 pm | User Presentation (TBD) |
| 12.00 pm – 1.00 pm | Lunch |
| 1.00 pm – 1.30 pm | Using artificial intelligence to find the estimation formula |
| 1.30 pm – 2.00 pm | Input to playground area from partner via the cloud |
| 2.00 pm – 2.30 pm | ShipWeight – next release |
| 2.30 pm – 3.00 pm | Coffee break |
| 3.00 pm – 3.30 pm | ExpressMarine modelling with link to ShipWeight |
| 3.30 pm – 4.30 pm | Questions and Answers/Discussions |

We reserve the right to change the agenda.


# Society of Allied Weight Engineers, Inc.

*Aerospace - Marine - Offshore - Land Vehicles and Allied Industries*