TECHNICAL UNIVERSITY OF VARNA

18-th Congress of International Maritime Association of the Mediterranean

TÉCNICO LISBOA

Sustainable Development and Innovations in Marine Technologies

IMAM 2019

PROGRAMME

9 - 11 September 2019
Hotel "Cherno More"
Varna, Bulgaria

ORGANIZATION

Congress Chairman

Petar Georgiev, Technical University of Varna, Bulgaria

International Scientific Committee Chairman

Carlos Guedes Soares, Instituto Superior Técnico, University of Lisbon, Portugal

Local Organizing Committee Chairman

Rumen Kishev, Bulgarian Ship Hydrodynamic Centre, Varna, Bulgaria

National Support Committee Chairman

Svetlin Stoyanov, Bulgarian National Association of Shipbuilding and Shiprepair, Varna, Bulgaria

International Scientific Committee

Moustafa Abdel-Marksoud, *Hamburg University of Technology (TUHH), Germany*
Ahmet Dursun Alkan, *Yildiz Technical University, Turkey*
Felice Arena, *University of Mediterranea of Reggio Calabria, Italy*
Eugen Bârsan, *Constanta Maritime University, Romania*
Ermina Begović, *University of Naples Federico II, Italy*
Kostas A. Belibassakis, *National Technical University of Athens, Greece*
Marco Biot, *Università degli Studi di Trieste, Italy*
Rui Carlos Botter, *Universidade de São Paulo, Brasil*
Emilio Campana, *INSEAN, Italy*
Francisco del Castillo, *Fundación Soermar, Spain*
Nastia Degiuli, *University of Zagreb, Croatia*
Roko Dejhalla, *University of Rijeka, Croatia*
Leonard Domnisoru, *University of Galati, Romania*
Cesar Ducruet, *Paris Geo, CNRS, France*
Gennadiy Egorov, *Marine Engineering Bureau, Ukraine*
Selma Ergin, *Istanbul Technical University, Turkey*
Ahmet Ergin, *Istanbul Technical University, Turkey*
R. Cengiz Ertekin, *University of Hawaii at Manoa, USA*
Stefano Ferraris, *FINCANTIERI, Italy*
Massimo Figari, *University of Genova, Italy*
Juana Fortes, *LNEC, Portugal*
Yordan Garbatov, *IST, Universidade de Lisboa, Portugal*
José M. Gordo, *IST, Universidade de Lisboa, Portugal*
Omer Goren, *Istanbul Technical University, Turkey*
Gregory Grigoropoulos, *National Technical University of Athens, Greece*
Stein Haugen, *NTNU, Norway*
Dimitrios Konovessis, *Nanyang Technical University, Singapore*
Pentti Kujala, *Aalto University, Finland*
Jean-Marc Laurens, *ENSTA Bretagne, France*
Heba Leheta, *Alexandria University, Egypt*
Ould El Moctar, *University of Duisburg-Esen, Germnay*
Lorenzo Moro, *Memorial University, Canada*
Alberto Moroso, *Associazione Italiana di Tecnica Navale, Italy*
Nikitas Nikitakos, *University of the Aegean, Greece*
Vladimir Nikitin, *Krylov State Research Centre, Russian Federation*
Luís R. Nuñez Rivas, *ETSIN, Universidad Politecnica de Madrid, Spain*
Andrea Orlandi, *Consorzio LaMMA, Florence, Italy*
Joško Parunov, *University of Zagreb, Croatia*
Mathias Paschen, *Rostock University, Germany*
Fernando López Peña, *University A Coruña, Spain*
Francisco Taveira Pinto, *University of Porto, Portugal*
Floriano C.M. Pires, Jr., *Universidade Federal do Rio de Janeiro, Brasil*
Jasna Prpić-Oršić, *University of Rijeka, Croatia*
Vicent Rey, *University of Toulon, France*
Cesare Rizzo, *University of Genoa, Italy*
Enrico Rizzuto, *University of Naples, Italy*
Germán Rodríguez, *U. Las Palmas de Gran Canaria, Spain*
Eugen Rusu, *Dunarea de Jos University of Galati, Romania*
Antonello Sala, *CNR, Italy*
Antonio Scamardella, *Univ di Napoli "Parthenope", Italy*
Kostas Spyrou, *National Technical Univ. Athens, Greece*
Ângelo Palos Teixeira, *IST, Universidade de Lisboa, Portugal*
Nikolaos Ventikos, *National Technical Univ. Athens, Greece*
Michele Viviani, *University of Genova, Italy*
Klaas Visser, *Delft Technical University, The Netherlands*
Xinping Yan,*Wuhan University of Technology, China*
Panos Yannoulis, *OCEANKING Technical &Trading SA, Greece*
HüseyinYilmaz, *Yildiz Technical University, Turkey*
Ermal Xhelilaj, *University of Vlora, Albania*

Technical Programme Secretariat

Maria de Fátima Pina, *IST, Universidade de Lisboa, Portugal*
Sandra Ponce, *IST, Universidade de Lisboa, Portugal*
Bruna Covelas, *IST, Universidade de Lisboa, Portugal*

Local Organizing Committee

Vencislav Valchev, *Technical University of Varna, Bulgaria*
Boyan Mednikarov, *Nikola Vaptsarov Naval Academy, Bulgaria*
Kalin Kalinov, *Nikola Vaptsarov Naval Academy, Bulgaria*
Snejanka Moncheva, *Institute of Oceanology, Bulgarian Academy of Science, Varna, Bulgaria*
Atanas Palazov, *Institute of Oceanology, Bulgarian Academy of Science, Varna, Bulgaria*
Stefan Kyulevcheliev, *Bulgarian Ship Hydrodynamic Centre, Varna, Bulgaria*
Irina Kostova, *Technical University of Varna, Bulgaria*
Bozhidar Dyakov, *Technical University of Varna, Bulgaria*
Valentin Giurov, *Technical University of Varna, Bulgaria*
Christo Pirovsky, *Technical University of Varna, Bulgaria*
Galina Ilieva, *Technical University of Varna, Bulgaria*
Nikolay Atanasov, *High-Technology Park- TUV Ltd., Varna, Bulgaria*
Yordanka Sachkova, *Technical University of Varna, Bulgaria*

Technical Secretariat

Lichko Naydenov, *Technical University of Varna, Bulgaria*
Yordan Denev, *Technical University of Varna, Bulgaria*
Sevdalin Valchev, *Technical University of Varna, Bulgaria*
Stela Miteva, *Technical University of Varna, Bulgaria*
Nilyana Petrova, *High-Technology Park- TUV Ltd., Varna, Bulgaria*
Blaga Valeva, *High-Technology Park- TUV Ltd., Varna, Bulgaria*

National Support Committee

Sasho Dobrev, *Bulyard – Shipbuilding industry AD, Varna, Bulgaria*
Dimitar Todorov, *Odessos Shiprepair Yard S.A, Varna, Bulgaria*
Ivan Daskalov, *Ship Machine – Building JSCo, Varna, Bulgaria*
Aleksandar Kalchev, *Navigation Maritime Bulgare, Varna, Bulgaria*
Petar Seferov, *Port of Varna, Varna, Bulgaria*
Lyudmil Stoev, *Keppel FELS Baltech Ltd, Varna, Bulgaria*
Plamen Prodanov, *Cosmos Shipping Ltd., Varna, Bulgaria*
Veselin Nenkov, *Marine Design Ltd, Varna, Bulgaria*
Georgi Georgiev, *Bulmar Consult, Ltd, Varna, Bulgaria*
Plamen Dzhambazov, *Dzambo, EOOD, Varna, Bulgaria*
Elena Velikova, *Bulgarian National Association of Shipbuilding and Shiprepair, Varna, Bulgaria*
Nedelcho Vichev, *Local Organization of Scientific and Technical Unions, Varna, Bulgaria*
Bogdan Bogdanov, *Bulgarian Chamber of Shipping, Varna, Bulgaria*

IMAM 2019- SCHEDULE AT A GLANCE

Monday, 9 September 2019		Registration (from 8h00 onwards)
Opening *(09h30-10h00) – Black sea Hall (3)*		
Plenary session 1 *(10h00-10h30) – Black sea Hall (3)* ***Keynote lecture 1***		
Coffee break (10h30-11h00)		
Plenary session 2 *(11h00-12h00) –Black sea Hall (3)* ***Keynote lectures 2 & 3***		
Lunch (12h00-14h00)		
Varna Hall (1) 14h00-15h30	*Odessos Hall 2 14h00-15h30*	*Black sea Hall (3) 14h00-15h30*
Special Session in Honour of Prof. Pentscho Pentschew, S1.1	**Offshore renewable energy & coastal development, S2.1**	**Hydrodynamics, S3.1**
Coffee-break (15h30-16h00)		
Varna Hall (1) 16h00-17h30	*Odessos Hall 2 16h00-17h30*	*Black sea Hall (3) 16h00-17h30*
Ship design (1), S1.2	**Offshore & coastal development, S2.2**	**Hydrodynamics-seakeeping, S3.2**
Tuesday, 10 September 2019		Registration (from 8h00 onwards)
Varna Hall (1) 9h00-10h30	*Odessos Hall 2 9h00-10h30*	*Black sea Hall (3) 9h00-10h30*
Ship design (2), S1.3	**Offshore renewable energy, S2.3**	**Hydrodynamics – resistance (1), S3.3**
Coffee-break (10h30-11h00)		
Varna Hall (1) 11h00-12h30	**Technical Visit** **Bulgarian Ship Hydrodynamic Centre** (morning visit)	*Black sea Hall (3) 11h00-12h30*
Ship Design (3), S1.4		**Hydrodynamics – resistance (2), S3.4**
Lunch (12h30-14h00)		
Varna Hall (1) 14h00-15h30	**Technical Visit** **Bulgarian Ship Hydrodynamic Centre** (afternoon visit)	*Black sea Hall (3) 14h00-15h30*
Ship structures (1), S1.5		**Hydrodynamics - manoeuvring(1), S3.5**
Coffee-break (15h30-16h00)		
Varna Hall (1) 16h00-17h30		*Black sea Hall (3) 16h00-17h30*
Ship structures (2), S1.6		**Hydrodynamics – manoeuvring(2), S3.6**
Meeting of IMAM Executive Committee (17h30-18h30)		
19h30 Congress Dinner		
Wednesday, 11 September 2019		Registration (from 8h00 onwards)
Varna Hall (1) 9h00-10h30	*Odessos Hall 2 9h00-10h30*	*Black sea Hall (3) 9h00-10h30*
Propulsion (1), S1.7	**Shipyards, S2.7**	**Hydrodynamics – sea waves, S3.7**
Coffee-break (10h30-11h00)		
Varna Hall (1) 11h00-12h30	*Odessos Hall 2 11h00-12h30*	*Black sea Hall (3) 11h00-12h30*
Propulsion (2) S1.8	**Marine transportation, S2.8**	**Machinery & control (1), S3.8**
Lunch (12h30-14h00)		
Varna Hall (1) 14h00-15h30	*Odessos Hall 2 14h00-15h30*	*Black sea Hall (3) 14h00-15h30*
Propulsion (3), S1.9	**Marine transportation & Safety, S2.9**	**Machinery & control (2), S3.9**
Coffee-break (15h30-16h00)		
Varna Hall (1) 16h00-17h30	*Odessos Hall 2 16h00-17h30*	*Black sea Hall (3) 16h00-17h30*
Aquaculture & fishing, S1.10	**Safety and marine environment protection, S2.10**	
17h30 General Assembly of IMAM ***End of IMAM2019 Congress***		

SESSIONS IN ALPHABETICAL ORDER

Session	Day	Time	Hall
Aquaculture & fishing, S1.10	Wednesday, 11/09/2019	16h00	Varna Hall (1)
Hydrodynamics - manoeuvring (1), S3.5	Tuesday, 10/09/2019	14h00	Black sea Hall (3)
Hydrodynamics - manoeuvring (2), S3.6	Tuesday, 10/09/2019	16h00	Black sea Hall (3)
Hydrodynamics – resistance (1), S3.3	Tuesday, 10/09/2019	9h00	Black sea Hall (3)
Hydrodynamics – resistance (2), S3.4	Tuesday, 10/09/2019	11h00	Black sea Hall (3)
Hydrodynamics – sea waves, S.3.7	Wednesday, 11/09/2019	9h00	Black sea Hall (3)
Hydrodynamics, S.3.1	Monday, 9/09/2019	14h00	Black sea Hall (3)
Hydrodynamics-seakeeping, S3.2	Monday , 9/09/2019	16h00	Black sea Hall (3)
Machinery & control (1), S3.8	Wednesday, 11/09/2019	11h00	Black sea Hall (3)
Machinery & control (2), S3.9	Wednesday, 11/09/2019	14h00	Black sea Hall (3)
Marine transportation & Safety, S2.9	Wednesday, 11/09/2019	14h00	Odessos Hall 2
Marine transportation, S2.8	Wednesday, 11/09/2019	11h00	Odessos Hall 2
Offshore & coastal development, S2.2	Monday , 9/09/2019	16h00	Odessos Hall 2
Offshore renewable energy & coastal development, S2.1	Monday , 9/09/2019	14h00	Odessos Hall 2
Offshore renewable energy, S2.3	Tuesday, 10/09/2019	9h00	Odessos Hall 2
Propulsion (1), S1.7	Wednesday, 11/09/2019	9h00	Varna Hall (1)
Propulsion (2) S1.8	Wednesday, 11/09/2019	11h00	Varna Hall (1)
Propulsion (3), S1.9	Wednesday, 11/09/2019	14h00	Varna Hall (1)
Safety and marine environment protection, S2.10	Wednesday, 11/09/2019	16h00	Odessos Hall 2
Ship design (1), S1.2	Monday , 9/09/2019	16h00	Varna Hall (1)
Ship design (2), S1.3	Tuesday, 10/09/2019	9h00-	Varna Hall (1)
Ship Design (3) S1.4	Tuesday, 10/09/2019	11h00	Varna Hall (1)
Ship structures (1), S1.5	Tuesday, 10/09/2019	14h00	Varna Hall (1)
Ship structures (2), S1.6	Tuesday, 10/09/2019	16h00	Varna Hall (1
Shipyard, S2.7	Wednesday, 11/09/2019	9h00	Odessos Hall 2
Special Session in Honour of Prof. Pentscho Pentschew, S1.1 –	Monday , 9/09/2019	14h00	Varna Hall (1)

IMAM2019 Programme	Monday, 9 September 2019	
9h30– 10h00 – Black sea Hall (3)	**Opening session**	*Opening Addresses*
10h00-10h30 – Black sea Hall (3)	**Plenary session 1: *Keynote Lecture 1*** Chair: **P. Georgiev**	Challenges for the Black Sea sustainability and blue growth in the context of glocalization, *Snejana Moncheva, Institute of Oceanology, Varna, BAS*
Coffee-Break (10h30-11h00)		
11h00-12h00 – Black sea Hall (3)	**Plenary session 2: *Keynote Lectures 2 &3*** Chair: **R. Kishev**	Global Player at the German Baltic Coastline Mecklenburg-Western Pomerania in the Focus of Asian Investors *Ralf Tschullik, MV WERFTEN Wismar GmbH* The development of Second Generation Intact Stability Criteria *Alberto Francescutto, University of Trieste*
Lunch (12h00-14h00)		
(14h00-15h30) Varna Hall (1) **Special Session in Honour of Prof. Pentscho Pentschew, S.1.1** Chairs: **P. Georgiev, Y.Garbatov**	(14h00-15h30) Odessos Hall (2) **Offshore renewable energy & coastal development, S2.1** Chairs: **S.Moncheva, E. Ôguz**	(14h00-15h30) Black sea Hall (3) **Hydrodynamics, S3.1** Chairs: **S. Ergin**, **K.Niklas**
Ultimate strength of box girders considering welding residual stresses. *T. Lindemann, E. Backhaus, Z. Bi & P. Kaeding*	Boosting offshore renewable energy in Europe: Skills shortages and gaps in education and training *E. Sdoukopoulos, V.M. Perra, G. Tsafonias, M. Boile & L. Fraga Lago*	Investigation of flow noise with different turbulence models *S. Bulut & S. Ergin*

Technical solutions for deep-sea vehicles that withstand the enormous ambient pressure *M. Paschen & K. Breddermann* Modal analysis of wind turbine rotor blades on the basis of a damped eigenvalue problem *E. Stanoev*	Life cycle assessment of two different renewable energy systems for a selected region: Bozcaada Island *A.E. ¸Sentürk & E. Ôguz* Sea-basin monitoring system assessment activity to support sustainable growth in the marine and maritime economy *A. Palazov, V. Slabakova, V. Lyubartsev, N. Pinardi, F. Blanc & E. Moussat*	On the use of Smoothed Particles Hydrodynamics for the simulation of a two dimensional dam-breaking flow *G.K. Dafermos & G.N. Zaraphonitis* On an extended boundary method for the removal of irregular frequencies in 3D pulsating source panel methods *G.K. Dafermos, G.N. Zaraphonitis & A.D. Papanikolaou*
Coffee-Break (15h30-16h00)		
(16h00-17h30) Varna Hall (1) **Ship design (1), S1.2** Chairs**: V. Slapničar, I.A. Koromila**	(16h00-17h30) Odessos Hall (2) **Offshore & coastal development, S2.2** Chairs: **A.Palazov, E. Sdoukopoulos,**	(16h00-17h30) Black sea Hall (3) **Hydrodynamics-seakeeping, S3.2** Chairs: **R.Kishev, G.K. Dafermos**,
Justification of main characteristics of river-sea dry-cargo vessels with extra-full hull forms *G.V. Egorov, V.I. Tonyuk, A.G. Egorov & I.F. Davydov* Features of the CV03 concept of floating transshipment complex with open cargo hold *G.V. Egorov, V.I. Tonyuk, A.G. Egorov &A.V. Demidyuk* Multi attribute design decision solution of MPV accounting for shipyard building constraints *P. Georgiev, Y. Garbatov, L. Kirilov &Y. Denev*	Pneumo-structures for gravitational hydrotechnical construction *A. Palazov, G. Georgiev &V. Donev* Drone-based geomorphological and landscape mapping of Bolata Cove, Bulgarian coast *B. Prodanov, I. Kotsev, T. Lambev, L. Dimitrov, R. Bekova & D. Dechev* Comparative study of the capacity of three plant species from the Poaceae family for erosion and flooding control of coastal areas *S. Vergiev*	On the assessment of roll damping for a damaged ferry *M. Acanfora, T. Coppola, F. De Luca & D. Lauria* Numerical prediction with experimental validation of semisubmersible's viscous damped heave motions *R. Kishev, G. Nikolov & S. Kirilova* On the seakeeping behaviour of an offshore wind farm vessel during the jack-up process in the early design stage *M. Liebert* Improvement of ships seakeeping performance by application of the full-scale CFD simulations *K. Niklas & H. Pruszko*

IMAM2019 Programme Tuesday, 10 September 2019

(9h00-10h30) Varna Hall (1) **Ship design (2), S1.3** Chairs**: E. Rizzuto**, **V.I. Tonyuk**,	(9h00-10h30) Odessos Hall (2) **Offshore renewable energy, S2.3** Chairs: **E. Ôguz, N. Markov**	(9h00-10h30) Black sea Hall (3) **Hydrodynamics – resistance (1), S3.3** Chairs: **S. Kyulevcheliev, C. Delen**
Dynamic analysis of the stationary behavior of resilient mounting elements for marine applications *J. Fragasso & L. Moro*	WEC performance and optimization in variable bathymetry regions *K.A. Belibassakis & M.I. Bonovas*	Onboard measurements to verify biofouling effect on ship performance *E. Altarriba & J. Halonen*
Application of the Second Generation Intact Stability Criteria for fast semi displacement ships *E. Begović, B. Rinauro & F. Cakici*	CFD simulation of the hydrodynamic performance of a fin-ring marine current turbine *M.I. Ibrahim, T.M. Hamed &A.A. Banawan*	On the influence of local changes of the KCS hull form upon its total resistance *A.V. Pechenyuk*
Risk-based approach for evaluating alternative ship design for fire safety *I.A. Koromila & K.J. Spyrou*	Efficiency of an oscillating water column device in front of a vertical breakwater *D.N. Konispoliatis & S.A. Mavrakos*	An investigation into the effect of the hull vane on the ship resistance in OPENFOAM *C. Celik, D.B. Danisman, P. Kaklis & S. Khan*
Coffee-Break (10h30-11h00)		
(11h00-12h30) Varna Hall (1) **Ship design (3), S1.4** Chairs: **V.I. Tonyuk**, **P.Georgiev**	**Technical Visit** **Bulgarian Ship Hydrodynamic Centre** (morning visit)	(11h00-12h30) Black sea Hall (3**)** **Hydrodynamics – resistance (2), S3.4** Chairs: **K.A. Belibassakis, D.Efremov**
Computer model application to the evaluation of energy efficiency measures for cruise ships *L. Mocerino & E. Rizzuto*		Uncertainty analysis of numerical and experimental resistance tests for ONR Tumblehome *C. Delen & S. Bal*

Eco patrol and control vessel – EPACV *V. Slapničar, I. Adum, I. Grubišić& H. Orešković* Development of autonomous underwater vehicle *A.K. Sujith, A. Mathew, S. Shajan, S. Pai G. & P.G. Sunil Kumar*		Resistance tests with 3D printed models in the early ship design stage of high speed vessels *R. Kloske, M. Josten & B. Carstensen* A nonlinear BEM for the ship wave-resistance problem *K.A. Belibassakis &A. Kegkeroglou*
Lunch (12h30-14h00)		
(14h00-15h30) Varna Hall (1) **Ship structures (1), S1.5** Chairs**: Y.Garbatov, M.S. Elsaka**		(14h00-15h30) Black sea Hall (3) **Hydrodynamics- manoeuvring (1), S3.5** Chairs**: N. Ma ,M.A. Hinostroza**
Structural strain approach for low-cycle fatigue life prediction of ship welded joints *P. Corigliano, V. Crupi, X. Pei & P. Dong* Design of honeycomb structures for naval applications *V. Crupi & G. Palomba* Determination of abrasion resistance of welded layers *A.M. Stoyanova & M.Iv. Konsulova-Bakalova*	**Technical Visit** **Bulgarian Ship Hydrodynamic Centre** (afternoon visit)	Prediction of maneuvering coefficients of Delft catamaran 372 hull form *S. Duman & S. Bal* Identification of the twin propellers – twin rudder system in vessel simulation model by "grey-box" method *D. Efremov & E. Milanov* Application of wavelet functions for identification of ship models *M.G. Todorova & R. Parvanova*
Coffee-Break (15h30-16h00)		
(16h00-17h30) Varna Hall (1) **Ship structures (2), S1.6** Chairs**: V. Crupi, M. Tekgoz**		(16h00-17h30) Black sea Hall (3) **Hydrodynamics- manoeuvring (2), S3.6** Chairs**: E. Milanov, S. Duman**
Quasi-static direct strength assessment of offshore multipurpose support vessel in head sea *M. Tekgoz, N. Almany &Y. Garbatov* FE analysis of support-specimen interaction of compressive experimental test *K.Woloszyk &Y. Garbatov* Uncertainty assessment of ultimate strength of corroded stiffened plates subjected to maintenance *K.Woloszyk &Y. Garbatov* Strength and weight characteristics of a self-propelled barge based on sandwich panel system construction *M.S. Elsaka, H.W. Leheta, A.S. Zayed & S.F. Badran*		Manoeuvring test for a self-running ship model in various water depth conditions *M.A. Hinostroza, H.T. Xu & C. Guedes Soares* Numerical simulation of PMM tests of a container ship in regular following waves *C.Q. Ma, N. Ma & X.C. Gu* Wave filtering for marine DP system using adaptive iterated extended Kalman filter *I. Popov & E. Milanov*

IMAM2019 Programme Wednesday, 11 September 2019

(9h00-10h30) Varna Hall (1) **Propulsion (1), S1.7** Chairs**: G. Grigoropoulos, M. Tadros**	(9h00-10h30) Odessos Hall (2) **Shipyards, S2.7** Chairs: **R. Perez Fernandez, S. Stoyanov**	(9h00-10h30) Black sea Hall (3) **Hydrodynamics – sea waves, S3.7** Chairs: **N. Ma , I. Popov**
Optimum design of a container ship's propeller from Wageningen B-series at the minimum BSFC *M. Tadros, M. Ventura & C. Guedes Soares*	Developing sustainable green ship recycling facilities in Indonesia: Investigation of current situation *S. Fariya, S.A. Gunbeyaz, R.E. Kurt, S. Sunaryo & E.B. Djatmiko*	A novel coupled-mode model for waves propagating in variable bathymetry in the presence of sheared currents, *K.A. Belibassakis & J. Touboul*
Propeller diameter selection based on numerical analysis of wake and induced-pressure on blades and on tunnel stern surface *C. Delen, F. De Luca, S. Mancini & C. Pensa*	Study into the reactive power consumption regimes in electric power supply system of shipbuilding enterprises *V.N. Gyurov*	Uncertainty analysis of parametric wave spectrum estimation from ship motions *M.A. Hinostroza & C. Guedes Soares*
Water-jet propulsion system with vectorised thrust *G. Ilieva*	What the CAD industry can do for the Shipyard 4.0 *R. Perez Fernandez & F.J. Regueira* Identifying skill shortages and education and training gaps for the shipbuilding industry in Europe *E. Sdoukopoulos, G. Tsafonias, V.M. Perra, M. Boile & L. Fraga Lago*	Study of weakly nonlinear water waves subjected to stochastic wind excitation *M. Hollm & L. Dostal*
Coffee-Break (10h30-11h00)		

IMAM2019 Programme Wednesday, 11 September 2019

(11h00-12h30) Varna Hall (**1**) **Propulsion (2), S1.8** Chairs**: G. Ilieva, C. Delen**,	(11h00-12h30) Odessos Hall (2) **Marine transportation, S2.8** Chairs: **B. Dyakov, M.Todorov,**	(11h00-12h30) Black sea Hall (3) **Machinery & control (1), S3.8** Chairs: **E. Rizzuto, M. Tadros**
Oceanic biomimicry – an effective tool to achieve an innovative blade design *G. Ilieva*	Shipping brokerage contract in Private International Law *D. Marinova*	Data acquisition and processing techniques for a novel performance monitoring system based on KPIs *N. Themelis, Ch.C. Spandonidis & Ch. Giordamlis*
A quantum propulsion method *N. Markov*	Current situation of VTS systems in Brazil and challenges for its implementation *E.R.N. Marques & E. Lobo*	Preliminary approach to the application of the Environmental Ship Index *L. Mocerino & E. Rizzuto*
Marine propeller optimization using open-source CFD *Th. Papakonstantinou, G. Grigoropoulos & G. Papadakis*	Development of a navigation support system by means of a synthetic scenario *M. Martelli, N. Faggioni & R. Zaccone*	Simulation of the performance of marine genset based on double-Wiebe function *M. Tadros, M. Ventura & C. Guedes Soares*
Lunch (12h30-14h00)		
(14h00-15h30) Varna Hall (1) **Propulsion (3), S1.9** Chairs**: N.Markov, G. Ilieva**	(14h00-15h30) Odessos Hall (2) **Marine transportation & Safety, S2.9** Chairs: **S. Ergin, Y.Denev**	(14h00-15h30) Black sea Hall (3) **Machinery & control (2), S3.9** Chairs: **Ch.Pirovski, L. Mocerino**
A methodology to predict the thrust-reduction C. Celik &A. Bolek	Happiness –Wind of change for shipping companies, a new way to measure their performance *S. Niyazieva*	Application of high temperature fuel cell powered by LNG on a ferry boat: a case study *T. Coppola, L. Micoli & M. Turco*
Towards the development of a bio-inspired shark-shaped unmanned underwater vehicle *S. Janardhanan, P. Venu, F.B. Shahabudheen, A. Issac, O. Abhijith, P. Das & G. Ilieva*	A machine learning approach to assess vessel performance based on operational profile *A. Senteris, A. Kanellopoulou & G.N. Zaraphonitis*	A ship energy efficiency analysis by considering trim influence and waste recycling *V. Vigna, M. Altosole, M. Figari &A. Ferrari*
Controllability studies on fish-shaped unmanned under water vehicle undergoing manoeuvring motions *A.K. Ranjith, S. Janardhanan,V. Chandran, N.J. Gomez, G. Ilieva & J. Sygal*	Statistical analysis of MAIB database for the period 1990–2016 *B. Navas de Maya, S.I. Ahn & R.E. Kurt*	Predicting the performance of a sequentially turbocharged marine diesel engine using ANFIS *M. Tadros, M. Ventura, C. Guedes Soares & S. Lampreia*
Coffee-Break (15h30-16h00)		
(16h00-17h30) Varna Hall (1) **Aquaculture & fishing, S1.10** Chairs**: I. Zlateva, E. Sepp**	(16h00-17h30) Odessos Hall (2) **Safety and marine environment protection, S2.10** Chairs: **A. Simeonova, A. Senteris**	
GIS-aided spatial analysis of fish abundance and biomass in the Bulgarian Black Sea *V. Raykov & I.S. Kotsev*	Numerical study on natural convection in a ship cargo tank *K. Sahin & S. Ergin*	
Dioxins and dioxin-like PCB-s in perch and sander of North-Eastern Baltic Sea and Peipsi Lake *L. Järv, T. Raid, M. Simm, M. Radin, H. Kiviranta & P. Ruokojärvi*	Oil spills behavior on various sandy beaches along the Bulgarian Black Sea coast *A. Simeonova & K. Stankovich*	

Does spatial patterns in fishing explain dynamics of commercial pelagic populations in Baltic Sea? *E. Sepp, T. Raid &T. Arula* LWR models of 2 commercially important species from the Bulgarian marine area *I. Zlateva, N. Nikolov, V. Raykov & M. Yankova*	Introducing a bio-inspired Life-Cycle Framework for emerging risks in the maritime industry *N.P. Ventikos & K. Louzis*	

Prof. Pentscho PENTSCHEW Honorary Session

An honorary session dedicated to Professor Pentscho Pentschew from Rostock University is included in the program of the 18th IMAM Congress. His 40 years of teaching and research activities are closely related to the development of Varna Technical University.

He started his study at the Technical University of Varna, specialty “Shipbuilding” in 1964. From 1967 to 1970 he continued his studies at the Rostock University where he passed the final exams as Dipl.-Ing. for shipbuilding.

He received his promotion as Dr.-Ing., Univ. Rostock in 1976 by the thesis titled “Analytical dimensioning of the dressings in the main cross-section of ships including nonlinear optimization methods”. He did his habilitation 1989 at the same university by the thesis “Principles and methods for the prediction of ship mass and mass distribution as well as their influence on selected ship parameters in the computer aided ship design and construction process”.

Over the years Prof Pentscho Pentschew has consistently worked as assistant at the Shipbuilding Faculty of the Rostock University, Department of Ship Design (1970 to 1977); Head of the laboratory for manufacturing and testing machine elements at the Machine Engineering Institute Varna (1977 to 1981); research assistant at the Section of Machine Engineering and Ship Technology of the Rostock University, Institute of Production Engineering, Shipbuilding and Computer Aided Engineering (1981 to 1992)

From 1992 to the year of his retirement in 2007 he was a Professor of Shipbuilding and Steel Construction at University of Rostock, Faculty of Mechanical Engineering and Ship Technology.

His teaching and research areas are: Hull design; Designing ships; Steel construction; Ocean wave and wind energy utilization; Modelling, determination and simulation of maritime structures; Reduction of pollutant input; Renewable Energies; Further education for the Maritime Industry.

Professor Pentschew is a member of a number of prestigious institutions and holder of honorary titles: Member of the Shipbuilding Engineering Society – STG (since 1990); Member of the Academy of Sciences and Arts "Peter I", Saint Petersburg, Russia (since 1994); Member of the Association of German Engineers –VDI (since 1995); Dr. hc, of TU Varna (since 1995), Visiting Professor at TU Varna (since 2003).

He and his colleagues and associates have developed a number of patents over the years

- Converter system with piezoelectric crystal sheets for obtaining electrical power from sea waves - DE4339307A1;
- Multiple system wave energy converter for electricity generation - DE19504356A1;
- Method of repair of wooden piles involves removing rotten upper end of pile and placing recyclable tube over end of pile to receive synthetic wood replacement pile section - DE102005031044A1;
- Apparatus for removing oil and/or oil-like contaminants drifting on the water surface - DE4321614A1;

Prof. Pentschew is considered to be the doyen of the cooperation between Varna Technical University and the University of Rostock. Over the years, within the framework of the cooperation between the two universities, many Bulgarian students have developed their diploma work at the Rostock University and have always been taken care of by Prof. Pentschew.

ACCOMPANYING EVENTS

"BLUES: BLUe growth connects European Seas"

The project is co-funded by the European Commission under Erasmus + Programme – KA2 *Cooperation for innovation and the exchange of good practices – Strategic Partnership for Vocational Education and Training*.

The project is implemented by a consortium of 5 organizations, from **5 different European countries (Greece, Cyprus, Bulgaria, Latvia and Spain**). The project coordinator is the **Municipality of Piraeus** with partners being **Enoros Consulting Ltd, Marine Cluster Bulgaria, Latvian Maritime Academy and Barcelona Cluster Nautic.**

The overall objective of the project is to promote the development of blue economy in the partner countries, strengthening cooperation between industry and education, to fill the skills gap in this sector and to raise awareness of Blue Careers and tools via the creation of a dedicated One Stop Shop Portal which also accommodate the e-learning Training Courses of the project.

Within the project framework three training courses have been developed, related to maritime sectors with significant importance for the participating countries: Maritime safety and security and Greening Maritime Transport; Coastal and Cruise Tourism and Fisheries Monitoring and Aquaculture. The courses are dedicated to professionals, VET learners, and unemployed people and are available on http://portal.bluesgrowth.eu/account/login in all partner languages, allowing potential users to acquire information on new skills and competences in new Blue Economy trends. Three pilot training workshops were organized in Latvia, Greece and Bulgaria.

To raise awareness on the project outputs, multiplier events were held in each country – the final one is envisaged to take place in Varna, Bulgaria on 10th September 2019 in frame of IMAM2019 Congress. During the workshop the e-learning courses will be demonstrated to the audience, as well as the project results.

11h00-12h30; Odessos Hall (2)	Consortium Meeting of BLUES Project
14h00-15h30 ; Odessos Hall (2)	E-learning courses workshop (open to attendance)
16h00-17h30; Odessos Hall (2)	

Black Sea FORAN Day

The 1st Black Sea FORAN Day will be held on the 11-12 of September 2019 within the framework of the IMAM 2019 congress.

The Black Sea FORAN Day will consist of two parts, a first part will be held on **11 September** at the IMAM congress, **"Cherno More" Hotel at 15:30**, with a coffee that will serve as networking and a presentation on the future of the naval industry in **Black sea Hall (3).**

The event will continue the next day with technical presentation of the new FORAN capabilities, in the Modus Hotel. A local design company will present their achievements and experience with FORAN

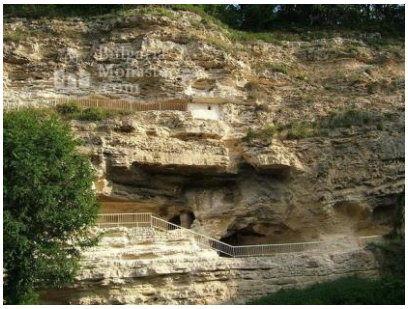
This is an event aimed to professionals of Marine Design, Marine Engineering, CAD and related services, either based in Bulgaria or other countries cooperating with Bulgarian shipbuilding or engineering companies.

To register to this free of charge event, send an email to any of the contacts: **fjose.regueira@sener.es** or **cristina.rsolano@sener.es**. Your earliest registration will be appreciated.

ACCOMPANYING PERSONS' PROGRAMME

Varna- the Black Sea Capital of Bulgaria - Ancient history and dynamic present

The town of Varna has a 26 centuries old history. Today it is considered to be one of the most dynamically developing European cities. The Black Sea Riviera has some of the best sandy beaches in Europe with a diversity of coast line.



1. Half day Varna City Tour

Panoramic tour of the town of Varna, incl. visit of Aladzha monastery (the most famous rock monastery on the Black Sea Coast), the Archaeological Museum where one of the oldest golden treasures in the world could be found and the Assumption Cathedral-the biggest Orthodox church in Varna. The sightseeing continues with a walking tour along the main promenade ending at the Central Entrance of Varna Sea Garden, modeled on the Viennese Baroque palace gardens. The impressive park also houses various museums and attractions - Dolphinarium, Aquarium, Naval Museum, Varna Zoo etc.

2. Half day tour to the town of Balchik and cape Kaliakra to the North of Varna and Golden Sands Resorts

Trip to cape Kaliakra and then to the picturesque town of Balchik to visit the Botanical garden and the former summer residence of the Romanian queen.

Transportation by bus Varna-Balchik-Golden Sands, services of English Speaking guide, entrance fee for the Botanical garden and the Summer Residence.(*Details in the Registration desk*).

CONGRESS VENUE

The 18th International Congress of the International Maritime Association of the Mediterranean (IMAM 2019) will be held at the Hotel "Cherno More" (Black Sea). The hotel is located in the pedestrian area of the city centre, only footsteps away from the Varna's historical and cultural landmarks, close to the beach and the beach promenade with its abundance of restaurants and clubs.

The hotel offers over 200 comfortable and stylish rooms and 3 contemporary conference halls named *Varna* (No 1) , *Odessos*. (No 2) and *Black Sea* (No 3)

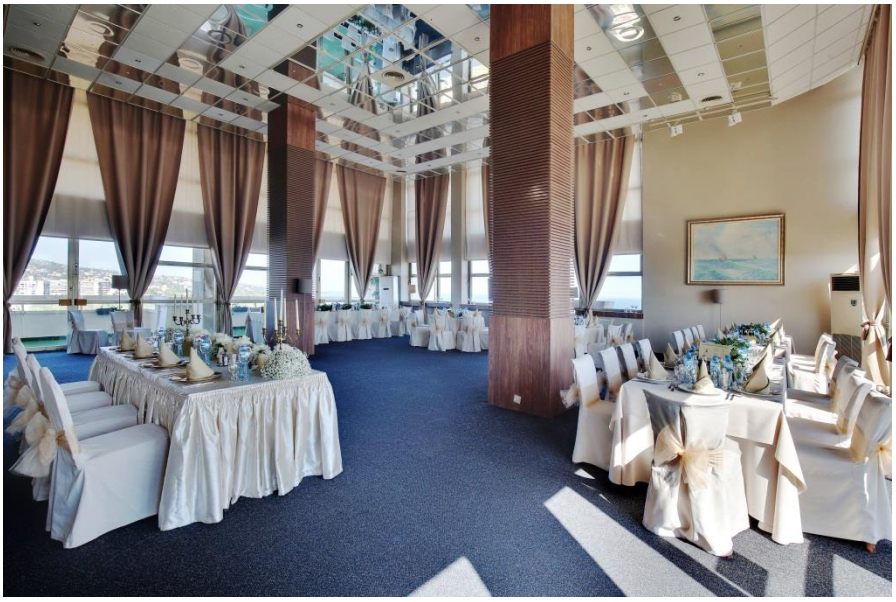
Varna Hall

Odessos Hall

Black Sea Hall

During the 3 days of the Congress, the coffee breaks will be served in the Lobby and lunches at the Panorama Restaurant

Lobby



Panorama Restaurant is located on the top floor building of the hotel "Cherno More". The restaurant welcomes its guests in elegant setting with stunning views over the city of Varna and the Black Sea. Guests can enjoy dishes from the Bulgarian and European cuisine and a selection of drinks.

Congress Dinner

Date: 10 September 2019

Time: 19:30 – 23:00

Place: Restaurant Varna

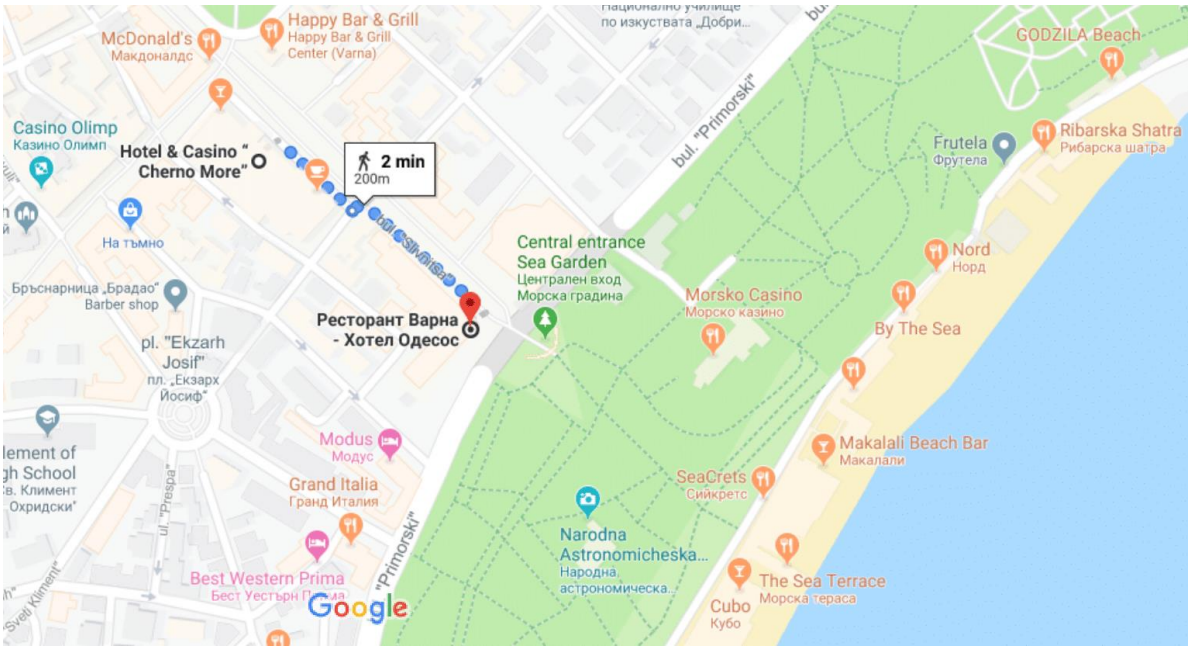
Tickets will be required to enter. You will receive them at the registration desk.

Restaurant Varna

'Varna' Restaurant is located at the heart of the seaside capital - under the city's iconic Odessos Hotel at the entrance of the Sea Garden - where the winter days stop to rest and the summer evenings lure everyone in love.

Opening its doors for the first time 40 years ago, over time 'Varna' Restaurant has proven its professionalism, quality and attention to its customers, who inevitably become friends.

The restaurant is located 200 m from hotel Cherno More.



Location of Restaurant Varna

IMPORTANT CONTACTS

Congress Location	Hotel & Casino “Cherno More” bul. “Slivnitza” No 33, 9000 Varna, Tel: +359 52 61 22 35 - 38, Mob. tel.: +359882 907 308 E-mail: reception@chernomorebg.com
Technical University of Varna	“Studentska” Str., No 1 9010 Varna Тел. +359 52 383 557 E-mail: rectorat@tu-varna.bg
CENTEC	Centre for Marine Technology and Ocean Engineering (CENTEC) Instituto Superior Tecnico Universidade de Lisboa Avenida Rovisco Pais Lisboa 1049-001 Tel: +351 218 417 468 E-mail: centec@centec.tecnico.ulisboa.pt
Congress Dinner	Restaurant Varna bul. “Slivnitza” No 1, Hotel Odessos Tel: +359 52 63 04 01, Mob. tel.: +359887 864 755 E-mail:varna.restaurant@gmail.com
Bulgarian Ship Hydrodynamics Centre (BSHC)	1 William Froude St., P.O. Box 58, 9003 Varna, Kv. Asparuhovo, Tel: +359 52 370 500 Fax: +359 52 370514 E-mail: office@bshc.bg

Wi-Fi Access	**Network**: HotelChernoMore **Password**: ChernoMoreVarna
Emergency Number	**112**

SPONSORS

ФОНД НАУЧНИ ИЗСЛЕДВАНИЯ
МИНИСТЕРСТВО НА ОБРАЗОВАНИЕТО И НАУКАТА

The National Science Fund (NSF) is a supportive and consultative body of the Ministry of Education and Science. It is one of the primary sources of financing of scientific research. The establishment of NSF was one of the first steps in introducing project-based funding by the Bulgarian government. The NSF provides financial support to universities, scientific institutions and other organizations engaged in research by launching competitions based on the rationale for development of partnerships and consortia building in performing collaborative research programmes and projects.

The NSF offers a procedure for supporting international scientific forums held in the Republic of Bulgaria. The purpose of the procedure is to support the holding of international scientific fora while respecting the principle of shared funding. This gives the opportunity for active involvement of Bulgarian scientists in the international scientific community, promotion of scientific results; their international comparability. Expected results: To establish and deepen the cooperation of Bulgarian scientists with leading scientists from abroad, to stimulate the participation of young scientists in international scientific events, to ensure the visibility of Bulgarian scientific research.(https://www.fni.bg/)

The IMAM2019 Congress is supported according to project КП -06-МНФ-15.

Морски клъстър България
MCB
Marine Cluster Bulgaria

Marine cluster Bulgaria is non-government organization consolidating the efforts of all sectors of the maritime economy in Bulgaria. The association acts towards the creation of favourable conditions for development and enhancement of the competitiveness of the blue economy by introducing new organizational, product, market and technological solutions, training, implementation of best practices, as well as for its promotion at national and international level.

Members of the cluster are SMEs, NGOs, educational institutions, and research and development organizations. Their activities are directed in different areas of the maritime industry: agency services, brokerage, water transport, ship management, ship supply, logistics; stock control; classification and conventional certification of vessels and floating structures; ship design; ship repair and reconstruction; research and development; education and training in marine engineering trades; maritime law.

Marine cluster Bulgaria is a full member of the European Network of Maritime Clusters and the Association of Business Clusters in Bulgaria.

As a member of the European Network of Maritime Clusters, MCB cooperates with national maritime clusters and their members, participates in the initiatives of the European Commission - Directorate General for Maritime Affairs and Fisheries.

The organization has the status "observer" and as such takes part in the Balkan and Black Sea Commission of the Conference of Peripheral Maritime Regions. (https://www.marinecluster.com/en/info/general-information/)

TEREM-SHIPYARD Flotski Arsenal - Varna (aka "Flotski arsenal") was found in 1897. It is situated on the shore of Varna lake at distance of 20 km from Varna, on territory of 617 000 sq. m, and has total length of the coastal line 1700 m. Complex repair of special production includes repair of surface naval vessels and submarines, weapons, radar stations and equipment, armament and many others (incl. Electronic, spare parts and lifesaving crafts).

Our Yard offers the following repair services: - Docking, class - and emergency repair of all types civil vessels; - Complex repair of surface naval vessels and submarines, including repair of armament, radar stations, navigation, hydro acoustic and other equipment; - All kinds of steel work; - Hull and tank blasting SA2; - Painting with all types paint;- Repair of main and auxiliary diesel engines, steam turbines, compressors, pumps, heat exchangers, boilers and etc.;- Repair of tail shafts, steering gears and bow thrusters;- Repair of electric, hydraulic and pneumatic gears, aggregates and systems;- Repair of control and measuring apparatus, electronic devices and systems.

Our Yard offers shipbuilding of small multi- purpose and special vessels - fire-fighting and salvage crafts, tug- and push boats, diver's crafts, torpedo recovery boats, minesweeper and etc.

The Shiprepair yard has experience in conversion of river going into sea-going ships, in conformance with shipowners' demands and requirements of the Classification Societies with aim extension of sailing area.

Contact: Varna 9000, Bulgaria, "Ladzhata" Area, P. O. Box 135, Tel. + 359 52 814 410; Fax: + 359 52 814 400; E-mail: office@krz-fa.com; Web site: www.krz-fa.com

SENER aspires to be a distinguished, international engineering group with a focus on the areas of Transport, Water, Environment, Processes, Gas, Power Generation, Aerospace, Safety and Defense, and Marine Engineering.

In each of these strategic areas, SENER has a sufficient team of excellent professionals that allows it to be competitive, serve its clients with unique value, and remain in the state-of-the-art. In each of its areas of activity, it is recognized by a capacity, specialty, or product in which it presents itself as a global leader. It l prioritizes contributions that offer the greatest added value to its clients, while remaining close to the conception and management of its projects and constructions. It supports efforts in R&D that make it possible to maintain and decisively advance in the areas defined. It distinguishes itself through technological contributions, value analysis, and reliable and effective operations.

It extends its engineering activities through other activities that broaden its participation in the value chain of its projects, such as system integration, manufacturing, construction, support and operation, delivering fully operational products, systems, and facilities.

It selectively invests in technological industries, always based on products or processes that are very closely related to its engineering specialties and innovations. (http://www.marine.sener/)

NOTES

NOTES

NSF Project КП06 МНФ 15