

# 15<sup>th</sup> International Conference On Integral Methods In Science And Engineering (IMSE2018)

University of Brighton, Brighton, United Kingdom

The conference will be held in the Huxley building on the Moulsecoomb campus of the University of Brighton.

The invited speakers will give their presentations in the Huxley Building Lecture theater.

The general conference sessions will either be in the lecture theater or in rooms 406/7 on the floor above.

The refreshments and buffet lunch will be served in the social area outside the lecture theater.

## **Travel to the conference venue from the city centre**

Participants staying in hotels on the seafront, can catch any bus on routes 25, 25X, 28, 29 or 29B bus (or any route 24 bus, but this route will be slightly slower) from outside the Brighton Pavilion. Please get off of the bus at the Brighton University stop (announced by the automated system on the bus). From the bus stop walk up Queensdown School Road, which runs up the side of the University campus, and the entrance to the Huxley building is on the left at the top of the hill.

Participants staying in the Pheonix Halls of residence can catch a number 25 bus along the main Lewes Road from the bottom of Southover Street. Please note that routes 25X, 28, 29 and 29B do not serve this particular bus stop.

Participants staying near the railway station can get a train from the main Brighton Station to Moulsecoomb station. The entrance to the Huxley building is on the right at the bottom of the steps from Moulsecoomb station.

Full details of how to get to the Moulsecoomb campus can be found on the University of Brighton website at

<https://www.brighton.ac.uk/about-us/contact-us/maps/brighton-maps/moulsecoomb-campus.aspx>

Monday 16 July 2018 (Morning)

09:00 - 10:30. Conference Registration. Tea and coffee will be available in the social area by the registration desk.

10:30 - 11:00 Conference Opening

Welcome to The University of Brighton, Prof Debra Humphris , Vice-Chancellor, The University of Brighton.

Welcome to 15<sup>th</sup> IMSE, Prof Christian Constanda, Chair of the International Steering Committee.

11:00 **Invited Speaker:** Sergei SAZHIN (University of Brighton).

Modelling of sprays: recent results and future challenges.

Chair: Paul Harris

Time	Lecture Theatre. Chair: Paul Harris. <i>General Session</i>	Room H406/7
12:00	Dmitry SAVOSTYANOV Tensor-product interpolation for high-dimensional integrals	

12:30 Lunch (served in the social area).

Monday 16 July 2018 (Afternoon)

13:30 **Invited Speaker:** Wolfgang SPROESSIG (Technische Universität Bergakademie Freiberg)  
Hypercomplex methods in applied analysis.  
Chair: Dugald Duncan.

Time	Lecture Theatre. Chair: Dugald Duncan <i>General Session</i>	Room H406/7
14:30	Ovadia SHOHAM (presented by Ram MOHAN) Design and Performance of a Multiphase Flow Manifold	
15:00	Wolfgang WENDLAND On Neumann's method and double layer potentials	

15:30 Refreshments (served in the social area).

Time	Lecture Theatre. Chair: Dmitry Savostyanov <i>General Session</i>	Room H406/7. Chair: Paul Harris. <i>General Session</i>
16:00	Diego QUINONES Approximation of the atomic wave function for perturbed potentials	Alessio FALOCCHI A comparison between two models for suspension bridges, introducing the convexification of the cables
16:30	Sabine BÖGLI Approximations of spectra of Schrodinger operators with complex potentials on $\mathbb{R}^d$	Hiroshi HIRAYAMA Numerical Calculation by quadruple precision higher order Taylor series method of The Pythagorean problem of three bodies
17:00	Matthias LIENERT A new class of Volterra-type integral equations from relativistic quantum physics	Gerson DA PENHA NETO Image processing for UAV autonomous navigation applying self-configuring neural network
17:30	Sabrina SAMBATTI Epidemic Genetic Algorithm for solving inverse problems: parallel algorithms	Eduardo PEREIRA A framework to determine black-hole distribution for large redshift

Tuesday 17 July 2018 (Morning)

09:00 **Invited Speaker:** Eduardo de SOUZA CURSI (Institut National des Sciences Appliquées de Rouen).  
 Uncertainty quantification in Engineering  
 Chair: Sergei Sazhin.

Time	Lecture Theatre. Chair: Sergei Sazhin. <i>General Session</i>	Room H406/7. Chair: Maria Eugenia Perez. <i>Homogenization and Thin Structures Mini-Symposium</i>
10:00	Barbara ZUBIK-KOWAL Error bounds for time-continuous schemes applied to nonlinear integro-differential equations	Patrizia DONATO Homogenization of some quasilinear elliptic problems with nonlinear Robin conditions and $L^1$ data
10:30	Mudasir YOUNIS Fixed point theorems and their applications	Massimo LANZA DE CRISTOFORIS A functional analytic approach to singular perturbation problems

11:00 Refreshments (served in the social area).

Time	Lecture Theatre. Chair: Wolfgang Sproessig. <i>General Session</i>	Room H406/7. Chair: Delfina Gómez. <i>Homogenization and Thin Structures Mini-Symposium</i>
11:30	Aline DA ROSA PARIGI On the $LTS_N$ nodal solution for the angular neutron flux in a two-dimensional Cartesian domain: A new approach to evaluate the exiting flux at the boundary	Matteo DALLA RIVA A hole close to the boundary
12:00	Alexander DABROWSKI Reconstruction of small particles with whispering gallery resonators	Paolo MUSOLINO A nonlinear problem for the Laplace equation with a degenerating Robin condition
12:30	Bardo BODMANN Alternative propositions of Cross Wavelet Analysis for use in non synchronized transient detection problem	Federica RAIMONDI Homogenization of a class of singular elliptic problems in perforated domains

13:00 Lunch (served in the social area).

Tuesday 17 July 2018 (Afternoon)

Time	Lecture Theatre. Chair: Haroldo Campos Velho. <i>General Session</i>	Room H406/7. Chair: Patrizia Donato. <i>Homogenization and Thin Structures Mini-Symposium</i>
14:00	Salam AL-BAYATI Transient Convection-Diffusion-Reaction Problems with Variable Velocity Field using DRBEM with Different Radial Basis Functions	Sara MONSURRO Homogenization of imperfect transmission problems with weakly converging data
14:30	Paul HARRIS A combined boundary element and finite element model of cell motion due to chemotaxis	Carmen PERUGIA Asymptotic behaviour of the exact controls for hyperbolic problems with imperfect interface
15:00	Wei WU Double-negative electromagnetic metamaterials due to chirality	Kirill CHEREDNICHENKO Dispersive effective behaviour of high-contrast periodic media

15:30 Refreshments (served in the social area).

Time	Lecture Theatre. Chair: Bardo Bodmann. <i>General Session</i>	Room H406/7. Chair: Jari Taskinen. <i>Homogenization and Thin Structures Mini-Symposium</i>
16:00	Layal HAKIM A cohesive zone approach analysing time dependent effects in viscoelastic materials	Julia ORLIK Homogenization and dimension reduction for a textile shell
16:30	Christian CONSTANDA Bending of Plates with Transverse Shear Deformation: The Robin Problem	Giuseppe CARDONE Spectrum of Neumann problems on thin waveguides with strongly corrugated boundary
17:00	Stanislav POTAPENKO Stress Concentrations Around Inclusions in Micropolar Elasticity	Pier D. LAMBERTI Boundary homogenization for polyharmonic operators

18:30 Fish and chips on Brighton Pier.

Wednesday 18 July 2018 (Morning)

Time	Lecture Theatre. Chair: Andreas Kirsch <i>General Session</i>	Room H406/7. Chair: Massimo Lanza De Cristoforis. <i>Homogenization and Thin Structures Mini-Symposium</i>
09:00	Luiz F. CHAVES BARCELLOS Parametric solutions in phase space of the neutron transport equation by Hermite polynomials	
09:30	Jesús P. CURBELO (presented by Ricardo BARROS) The adjoint spectral Green's function method applied to direct and inverse neutral particle source-detector problems	Jari TASKINEN Spectral Laplace problems on periodic and cuspidal domains.
10:00	Lucas MUSSOI On The Derivation of The Solution of The Neutron Diffusion Kinetic Equation in Cylindrical Geometry Starting From The Cartesian Geometry Solution	Rafael ORIVE-ILLERA Analysis of spectral gaps in a Dirichlet waveguide
10:30	Amarisio ARAUJO q-Calculus formalism for non-extensive particle filter	Maria Eugenia PÉREZ Asymptotics for spectral problems with mass concentration in small regions near the boundary

11:00 Refreshments (served in the social area).

Time	Lecture Theatre. Chair: Eduardo de Souza Cursi <i>General Session</i>	Room H406/7. Chair: Pier Lamberti <i>Homogenization and Thin Structures Mini-Symposium</i>
11:30	Deepak SINGH Existence of solutions of nonlinear integral equations arising from science and engineering problems	Delfina GÓMEZ Spectral problems in a T-like structure: high frequencies
12:00	Akshay RANE Modified projection method for second kind Fredholm integral equations with trigonometric polynomials	Elvira ZAPPALE Optimal design of thin strings with 'gap'
12:30	Rosario FERNANDES Singularity subtraction approximation for nonlinear weakly singular Fredholm integral equations of the second kind	Renata BUNOIU On the flow of a non-Newtonian fluid in a thin domain

13:00 Lunch (served in the social area).

14:00 Excursion.

Thursday 19 July 2018 (Morning)

09:30 **Invited Speaker:** Dugald DUNCAN, (Heriot-Watt University)  
Approximation of time domain boundary integral equations.

10:30 Refreshments (served in the social area).

Time	Lecture Theatre. Chair: Ram Mohan. <i>General Session</i>	Room H406/7. Chair: Wolfgang Wendland. <i>Boundary-Domain Integral Equations Mini-Symposium</i>
11:00	Maria PEREL Decompositions of solutions of the wave equation in Poincare wavelets	Carlos FRESNEDA-PORTILLO Boundary-Domain Integral Equations to the Mixed BVP for a Compressible Stokes System with Variable Viscosity
11:30	Andreas KIRSCH Scattering by an Open Tubular Waveguide in $R^3$ with a Period Refractive Index	Sergey MIKHAILOV Boundary-domain integral equations for variable-viscosity Stokes and Brinkman systems in $L_p$ -based spaces on Lipschitz domains
12:00	Adalberto SCHUCK A Simple Nonlinear Transfer Function for a Wiener-Hammerstein Model of Guitar Distortion and Overdrive Effects	Mulugeta A. DAGNAW Boundary-Domain Integral Equation Systems to the Dirichlet BVP for Stokes Equations with variable viscosity in 2D
12:30	Julio FERNANDES On Multi-group Transport Equation in Planar Geometry: Solution for Anisotropic Scattering.	Mirela KOHR Layer potentials and Poisson problems for the Stokes system with nonsmooth coefficients in Sobolev and Besov spaces

13:00 Lunch (served in the social area).

Thursday 19 July 2018 (Afternoon)

Time	Lecture Theatre. Chair: Christian Constanda. <i>General Session</i>	Room H406/7. Chair: Sergey Mikhailov <i>Boundary-Domain Integral Equations Mini-Symposium</i>
14:00	Andreas KLEEFELD Shape optimization for interior Neumann and transmission eigenvalues	Julia ORLIK Operator perturbation approach for fourth order elliptic equations with variable coefficients
14:30	Riccardo MOLINAROLO Existence of the solutions for a singularly perturbed nonlinear non-autonomous transmission problem	Tsegaye AYELE Two-operator boundary-domain integral equations for variable-coefficient Dirichlet BVP with general data.
15:00	Lukas PIERONEK The method of fundamental solutions and interior transmission eigenvalues	Solomon BEKELE Two-operator Boundary-Domain Integral Equations for variable coefficient Dirichlet boundary value problem in 2D

15:30 Refreshments (served in the social area).

Time	Lecture Theatre. Chair: Maria Perel. <i>General Session</i>	Room H406/7. Chair: Mirela Kohr <i>Boundary-Domain Integral Equations Mini-Symposium</i>
16:00	Dmitry PONOMAREV Solution of a homogeneous version of the Love type integral equation in different asymptotic regimes	Paolo LUZZINI Regularizing properties of periodic layer heat potentials and applications
16:30	Anastasia SEMENOVA On the application of the piecewise linear approximation and collocation method for a hypersingular integral equation	Zenebe WOLDEMICHEAL On analysis of united boundary-domain integro-differential equations for variable coefficient Dirichlet problem with general right hand side

19:00 Conference Dinner, Old Ship Hotel, Brighton Seafront.



Friday 20 July 2018 (Morning)

09:30 **Invited Speaker:** Ram MOHAN, (University of Tulsa).  
Control Strategies for Multiphase Compact Separators Development and Implementation.  
Chair: Christian Constanda.

10:30 Refreshments (served in the social area).

Time	Lecture Theatre. Chair: Paul Harris. <i>General Session</i>	Room H406/7. Chair: Dmitry Savostyanov <i>General Session</i>
11:00	Cibele LADEIA (presented by Bardo BODMANN) Integro-differential Radiative Conductive Transfer Equation: Modified Decomposition method	Roman PUKHTAIEVYCH Series expansion for the effective conductivity of ideal and non-ideal two-phase dilute composites
11:30	Ahmad SABRA Eliminating chromatic aberration using simple lenses.	Aditya SINGH Analytical approach for solving beam equation
12:00	Juliana SCHRAMM (presented by Bardo BODMANN) A Chemical Kinetics Extension by NO <sub>x</sub> and SO <sub>2</sub> to the Ad- vection Diffusion Equation.	Andreas PAPOUTSAKIS Extension of the Fully Lagrangian approach for the integra- tion of the droplet number density on caustic formations
12:30	Adolfo PIRES Semi Analytical Pressure Solution for Oil Displacement by Miscible Gas Injection in a Homogeneous Porous Media	

13:00 Conference closing.

13:15 Lunch (served in the social area).