



Conference

## *Differential Equations and Applications*

September 4–7, 2017, Brno, Czech Republic

*organized by*

**Institute of Mathematics, Faculty of Mechanical Engineering,  
Brno University of Technology**

*in cooperation with*

**Department of Mathematics and Statistics, Faculty of Science,  
Masaryk University**

**Institute of Mathematics of the Czech Academy of Sciences**

The conference is organized under the patronage by the Mayor of the City of Brno  
Petr Vokřál and financially supported by the City of Brno.





## Monday, September 4

9:00–11:00 *Registration (room U6)*

11:00–11:25 *Opening Ceremony (room P5)*

### Plenary lecture (room P5)

*Chairman:* Milan Tvrdý

11:30–12:15 **Jean Mawhin** (Louvain-la-Neuve, Belgium)  
Systems of ordinary differential equations with nonlocal boundary conditions

### Invited lecture (room P5)

*Chairman:* Milan Tvrdý

12:20–12:55 **Meirong Zhang** (Beijing, China)  
Dependence of eigenvalues on potentials and weights and optimal estimates of eigenvalues

13:00–14:00 *Lunch*

### Invited lecture (room P5)

*Chairman:* Milan Tvrdý

14:00–14:35 **Irina Astashova** (Moscow, Russia)  
On asymptotic properties of blow-up and Kneser solutions to higher-order Emden-Fowler type differential equations

### Section A (room P5)

*Chairman:* Svatoslav Staněk

14:45–15:10 **Shao-Yuan Huang** (Yunlin, Taiwan)  
Classification and evolution of bifurcation curve of positive solution for the one-dimensional Minkowski-curvature problem

15:15–15:40 **Mirosława Zima** (Rzeszów, Poland)  
Existence and localization results for the second order periodic boundary value problem

15:45–16:10 **Maria Telnova** (Moscow, Russia)  
Extremal estimates for the first eigenvalue of the Sturm-Liouville problem with Dirichlet boundary conditions and a weighted integral condition

16:15–16:40 **Maria de Fátima Fabião Ribeiro** (Lisboa, Portugal)  
A variant of Method of Step Algorithm for a delay differential equation

16:45–17:10 **Pasquale Candito** (Reggio Calabria, Italy)  
A coincidence point theorem and its applications

## **Section B (room U7)**

*Chairman:* Zdeněk Pospíšil

14:45–15:10 **Alexey Vladislavovich Filinovskiy** (Moscow, Russia)  
Spectral problems with singular perturbation

15:15–15:40 **Jonáš Volek** (Pilsen, Czech Republic)  
Existence and multiplicity for implicit discretization of Nagumo RDE on unbounded domain via variational methods

15:45–16:10 **Antonia Chinnì** (Messina, Italy)  
Applications of critical points results to existence and multiplicity of solutions for elliptic problems with variable exponent

16:15–16:40 **Daniela Ana Gurban** (Timișoara, Romania)  
Positive radial solutions for systems involving potential Lane-Emden nonlinearities and Minkowski operator

16:45–17:10 **Mehmet Fatih Karaaslan** (Istanbul, Turkey)  
Numerical simulation of the conservative fractional diffusion equations by HDG-method

## **Welcome party – boat cruise on the Brno water dam**

17:30 *Departure of the bus from the parking place in front of the building A1*

18:00 *Departure from the main harbour at Brno water dam*

## Tuesday, September 5

### Plenary lecture (room P5)

*Chairman:* Pavel Drábek

- 9:00–9:45 **Gabriele Bonanno** (Messina, Italy)  
The local minimum theorem and the mountain pass theorem: complements, relationships, remarks and applications

### Invited lectures (room P5)

*Chairman:* Pavel Drábek

- 10:00–10:35 **Eugenia Petropoulou** (Patras, Greece)  
Solving the nonlinear boundary layer flow equations with pressure gradient and radiation
- 10:45–11:20 **Mihály Pituk** (Veszprém, Hungary)  
The Lyapunov exponents of positive solutions of a perturbed system of functional differential equations
- 11:25–12:00 *Coffee Break (room U6)*

### Section A (room P5)

*Chairman:* Mirosława Zima

- 12:00–12:25 **Omar Benniche** (Miliana, Algeria)  
A global estimates for solutions to quasi-autonomous differential equations in abstract Banach spaces
- 12:30–12:55 **Giselle Antunes Monteiro** (Prague, Czech Republic)  
On  $g$ -differential equations and the Kurzweil-Stieltjes integral
- 13:00–14:00 *Lunch*

### Section B (room U7)

*Chairman:* Pavel Řehák

- 12:00–12:25 **Irena Rachůnková** (Olomouc, Czech Republic)  
State-dependent impulses and distributions in BVPs
- 12:30–12:55 **Wojciech Szumiński** (Zielona Góra, Poland)  
Integrability of natural Hamiltonian systems in curved spaces
- 13:00–14:00 *Lunch*

## Section A (room P5)

*Chairman:* Irena Rachůnková

- 14:00–14:25 **Beatrice Di Bella** (Messina, Italy)  
Existence results for fourth-order boundary value problems
- 14:30–14:55 **José Ginés Espín Buendía** (Cartagena, Spain)  
Some remarks on the Markus-Neumann theorem
- 15:10–15:35 **Igor Kossowski** (Lodz, Poland)  
Radial solutions for nonlinear elliptic equation with nonlinear nonlocal boundary conditions
- 15:40–16:05 **Kemal Özen** (Tekirdağ, Turkey)  
Solvability of a nonlocal problem by a novel concept of fundamental function
- 16:10–16:30 *Coffee Break (room U6)*

## Section B (room U7)

*Chairman:* Alexey Vladislavovich Filinovskiy

- 14:00–14:25 **Ilia Zabrodski** (Ås, Norway)  
Parameters estimation in S-systems
- 14:30–14:55 **Hazal Yüksekaya** (Diyarbakir, Turkey)  
Energy decay and global nonexistence of solutions for a nonlinear hyperbolic equation
- 15:10–15:35 **Anatoly Anikin** (Moscow, Russia)  
On effective asymptotic formulas for two-dimensional wave equation with localized right-hand side
- 15:40–16:05 **Joanna Balbus** (Wroclaw, Poland)  
Average conditions for permanence in N species nonautonomous competitive reaction-diffusion-advection systems
- 16:10–16:30 *Coffee Break (room U6)*

## Section A (room P5)

*Chairman:* Jiří Šremr

- 16:30–16:55 **Diogo Caetano** (Lisbon, Portugal)  
Stability and attractivity for Nicholson systems with time-dependent delays
- 17:00–17:25 **Sergey Anatolyevich Vasilyev** (Moscow, Russia)  
Regular and singular perturbation problems for infinite order system of differential equations with a small parameter

- 17:40–18:05 **Jan Böhm** (Brno, Czech Republic)  
Distributed delay differential equations - numerical approach
- 18:10–18:35 **Mohamed Bezziou** (Khemis Miliana, Algeria)  
Approximate viability result for fractional differential inclusions in abstract Banach spaces

### **Section B (room U7)**

*Chairman:* Sergey Andreevich Sergeev

- 16:30–16:55 **Adrián Alejandro Gómez Gaete** (Concepción, Chile)  
Non-monotone travelling waves solutions for a monostable reaction-diffusion equations with delay
- 17:00–17:25 **Tsvetan Hristov** (Sofia, Bulgaria)  
Protter-Morawetz problem for (3+1)-D equations of Keldysh type
- 17:40–18:05 **Cemaliye Kürt** (Famagusta, North Cyprus)  
Fractional wave equation with a frictional memory kernel of multivariate Mittag-Leffler type
- 18:10–18:35 **Todor Popov** (Sofia, Bulgaria)  
Singular solutions of Protter problems for the wave equation

## Wednesday, September 6

### Plenary lecture (room P5)

*Chairman:* Meirong Zhang

- 9:00–9:45 **Pierpaolo Omari** (Trieste, Italy)  
How to determine the shape of the human cornea: a contribution from nonlinear analysis

### Invited lectures (room P5)

*Chairman:* Meirong Zhang

- 10:00–10:35 **Paolo Salani** (Florence, Italy)  
TBA
- 10:45–11:20 **Chrysi Kokologiannaki** (Patras, Greece)  
Some results on the zeros of derivatives of Bessel functions
- 11:25–12:00 *Coffee Break (room U6)*

### Section A (room P5)

*Chairman:* Mihály Pituk

- 12:00–12:25 **Mervan Pašić** (Zagreb, Croatia)  
Localized extrema of ground state solution for nonlinear Schrödinger equation with non-monotone potential
- 12:30–12:55 **Vladimir Viktorovich Rogachev** (Moscow, Russia)  
On solutions with prescribed number of zeros to fourth-order regular Emden-Fowler type equation with negative potential
- 13:00–14:00 *Lunch*

### Section B (room U7)

*Chairman:* John Wyller

- 12:00–12:25 **Sergey Andreevich Sergeev** (Moscow, Russia)  
Asymptotic solution of the linearized Korteweg-de Vries equation
- 12:30–12:55 **Elisabetta Tornatore** (Palermo, Italy)  
Quasilinear elliptic Dirichlet problem with gradient dependence
- 13:00–14:00 *Lunch*



## Section A (room P5)

*Chairman:* Snezhana Hristova

- 14:00–14:25 **Eugene Bravyi** (Perm, Russia)  
Boundary value problems for families of functional differential equations
- 14:30–14:55 **Svatoslav Staněk** (Olomouc, Czech Republic)  
Existence results for implicit fractional differential equations with nonlocal boundary conditions
- 15:10–15:35 **Kseniya Dulina** (Moscow, Russia)  
On various types of asymptotic behavior of oscillating solutions to second-order Emden-Fowler type differential equations
- 15:40–16:05 **Peter Šepitka** (Brno, Czech Republic)  
Focal points of conjoined bases of linear Hamiltonian systems
- 16:10–16:30 *Coffee Break (room U6)*

## Section B (room U7)

*Chairman:* Efstratios Tzirtzilakis

- 14:00–14:25 **Michal Demetrian** (Bratislava, Slovakia)  
Cycles in models of monetary and fiscal stabilization policies
- 15:10–15:35 **Matúš Tibenský** (Bratislava, Slovakia)  
Application of the mean curvature flow in the image segmentation
- 15:40–16:05 **Tamar Zemach** (Tel-Hai, Israel)  
Approximated analytical solutions of shallow-water equations for particle-driven gravity currents propagating in channels of power-law cross-sections
- 16:10–16:30 *Coffee Break (room U6)*

## Section A (room P5)

*Chairman:* Mervan Pašič

- 16:30–16:55 **Roman Šimon Hilscher** (Brno, Czech Republic)  
Principal solutions in oscillation theory of linear Hamiltonian systems
- 17:00–17:25 **Jaroslav Jaroš** (Bratislava, Slovakia)  
Regular variation at a finite point and the existence of extinct solutions of differential equations with singular nonlinearities
- 17:40–18:05 **Snezhana Hristova** (Plovdiv, Bulgaria)  
Iterative techniques with initial time difference and computer realization for the initial value problem for Caputo fractional differential equations
- 18:10–18:35 **Goddy Ujagbe Agbeboh** (Ekpoma, Nigeria)  
On the parametric factorization and analysis of a cubic root mean 4th order Runge-Kutta formula

## Section B (room U7)

*Chairman:* Eugenia Petropoulou

- 16:30–16:55 **Zdeněk Pospíšil** (Brno, Czech Republic)  
Turing-like phenomenon on a discrete space-time
- 17:00–17:25 **Katarzyna Małgorzata Szymańska-Dębowska** (Lodz, Poland)  
Delayed exchange of stabilities for a singularly perturbed initial value problem
- 17:40–18:05 **Calogero Vetro** (Palermo, Italy)  
Existence results for  $(p, q)$ -Laplacian equations
- 18:10–18:35 **Tadas Telksnys** (Kaunas, Lithuania)  
KdV soliton solutions to a model of hepatitis C virus evolution

## Poster session (in front of room U6)

18:40–19:40 *Posters:*

**Monika Dosoudilová** (Brno, Czech Republic)  
Periodic boundary value problem for second order linear ordinary differential equations

**Claudio Andrés Gallegos** (Santiago, Chile)  
Measure functional differential equations with infinite time-dependent delay

**Tomáš Kisela** (Brno, Czech Republic)  
On stability of a linear FDE with a nonconstant coefficient

**Sulkhan Mukhigulashvili** (Brno, Czech Republic)  
On a periodic problem for higher-order differential equations with a deviating argument

**Veronika Novotná** (Brno, Czech Republic)  
On the construction of solution of economic problems described by systems of ordinary differential equations with delay

**Bedřich Půža** (Brno, Czech Republic)  
On the construction of solution of the linear boundary value problem of the system of linear functional differential equations

**Jiří Šremr** (Brno, Czech Republic)  
Some remarks on functional differential equations in abstract spaces

## Thursday, September 7

### Plenary lecture (room P5)

*Chairman:* Jaroslav Jaroš

- 9:00–9:45 **Pavel Drábek** (Pilsen, Czech Republic)  
Convergence to a new profile of travelling front in Fisher's population genetics model

### Invited lectures (room P5)

*Chairman:* Jaroslav Jaroš

- 10:00–10:35 **John Wyller** (Ås, Norway)  
Homogenization theory for neural field models
- 10:45–11:20 **Efstratios Tzirtzilakis** (Patras, Greece)  
Mathematical formulation and solution technique of Biomagnetic Fluid flow in an aneurism
- 11:25–12:00 *Coffee Break (room U6)*

### Section A (room P5)

*Chairman:* Robert Hakl

- 12:00–12:25 **Paweł Wilczyński** (Warszawa, Poland)  
Complicated dynamics in planar nonautonomous planar polynomial ODEs
- 12:30–12:55 **Margarita Zvereva** (Voronezh, Russia)  
A string oscillations simulation with nonlinear conditions
- 13:00–14:00 *Lunch*

### Section B (room U7)

*Chairman:* Petr Tomášek

- 12:00–12:25 **Vladimir Bobkov** (Pilsen, Czech Republic)  
On positive solutions for  $(p, q)$ -Laplace equations with two parameters
- 12:30–12:55 **Marek T. Malinowski** (Kraków, Poland)  
Fuzzy stochastic differential equations - A tool for stochastic systems with imprecise values
- 13:00–14:00 *Lunch*

## Section A (room P5)

*Chairman:* Luděk Nechvátal

- 14:00–14:25 **Mariia Burlutskaia** (Voronezh, Russia)  
On a resolvent approach in a mixed problem for the wave equation on a graph
- 14:30–14:55 **Rym Bourguiba** (Monastir, Tunisia)  
Existence results of a singular fractional differential equation with perturbed term
- 15:10–15:35 **Milan Tvrđý** (Praha, Czech Republic)  
Kurzweil-Stieltjes integral and its application to dynamic equations on time-scales
- 15:40–16:05 **Robert Hakl** (Brno, Czech Republic)  
Boundary value problems for systems of functional differential equations

## Section B (room U7)

*Chairman:* Zdeněk Opluštil

- 14:00–14:25 **Nolbert Yonel Morales Tineo** (Concepción, Chile)  
An approximation to the minimum wave for Nicholson Blowflies Equation
- 14:30–14:55 **Petr Tomášek** (Brno, Czech Republic)  
Modified midpoint method for delay differential equations - stability analysis
- 15:10–15:35 **Jagdish Prasad Maurya** (Varanasi, India)  
Exact solutions for unsteady axisymmetric vortex motions governing atmospheric vortices
- 15:40–16:05 **Jan Franců** (Brno, Czech Republic)  
Reliable solution of problems with uncertain hysteresis operators