



# PROGRAM

The 3rd International Conference  
and Summer School  
**Numerical Computations:  
Theory and Algorithms  
NUMTA 2019**

*dedicated to the 80th birthday of Professor Roman G. Strongin*



Le Castella di Isola Capo Rizzuto, Italy  
**June 15-21, 2019**

<http://si.dimes.unical.it/~yaro/numta2019>



# The 3rd International Conference and Summer School Numerical Computations: Theory and Algorithms NUMTA2019

## Chairman

**Yaroslav Sergeyev**, Rende, Italy

## Plenary Lectures and Tutorials

**Louis D'Alotto**, New York, USA

*Infinite games on finite graphs using Grossone*

**Renato De Leone**, Camerino, Italy

*Recent advances on the use of Grossone in optimization and regularization problems*

**Kalyanmoy Deb**, East Lansing, USA

*Karush-Kuhn-Tucker proximity measure for convergence of real-parameter single and multi-criterion optimization*

**Luca Formaggia**, Milan, Italy

*Numerical modeling of flow in fractured porous media and fault reactivation*

**Jan Hesthaven**, Lausanne, Switzerland

*Precision algorithms*

**Francesca Mazzia**, Bari, Italy

*Numerical differentiation on the Infinity Computer and applications for solving ODEs and approximating functions*

**Michael Vrahatis**, Patras, Greece

*Generalizations of the intermediate value theorem for approximations of fixed points and zeroes of continuous functions*

**Anatoly Zhigljavsky**, Cardiff, UK

*Uniformly distributed sequences and space-filling*

**Roberto Natalini**, Rome, Italy

*Vector kinetic approximations to fluid-dynamics equations*

**Yaroslav Sergeyev**, Rende, Italy

*Grossone-based Infinity Computing with numerical infinities and infinitesimals*

**Vassili Toropov**, London, UK

*Design optimization techniques for industrial applications: Challenges and progress*

## Organizing Committee

**Francesco Dell'Accio**, Rende, Italy

**(SIAM representative)**

**Alfredo Garro**, Rende, Italy

**Vladimir Grishagin**, Nizhni Novgorod, Russia

**Dmitri Kvasov**, Rende, Italy (Chairman)

**Marat Mukhametzhonov**, Rende, Italy

**Maria Chiara Nasso**, Rende, Italy

**Clara Pizzuti**, Rende, Italy

**Davide Rizza**, Norwich, UK

**Yaroslav Sergeyev**, Rende, Italy





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# Numerical Computations: Theory and Algorithms NUMTA 2019

TH Le Castella Village di Isola Capo Rizzuto, Crotone, Italy  
**June 15 - 21, 2019**

## PROGRAM

PROGRAM												
Saturday, June 15		Sunday, June 16		Monday, June 17		Tuesday, June 18		Wednesday, June 19		Thursday, June 20		
		09:00	Registration	09:00	Parallel sessions	09:00	Parallel sessions	09:00	Parallel sessions	09:00	Parallel sessions	
		09:40	Opening	09:20		09:20		09:20				
		10:00	Plenary Lecture Hesthaven	09:40		09:40		09:40		09:40		
				10:00		10:00		10:00		10:00		
				10:20		10:20		10:20		10:20		
				10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break	
		11:00	Plenary Lecture Deb	11:00	Plenary Lecture Formaggia	11:00	Plenary Lecture Zhigljavsky	11:00	Plenary Lecture Vrahatis	11:00	Parallel sessions	
		12:00	Conference photo and aperitif	12:00	Plenary Lecture Mazzia	12:00	Plenary Lecture De Leone	12:00	Plenary Lecture D'Alotto	11:00		
										11:20		
										11:40		
										12:00		
										12:20		
										12:40		
		13:00	Lunch									
		15:00	Parallel sessions	15:00	Parallel sessions	14:30	Excursion	15:00	Parallel sessions	15:00	Parallel sessions	
		15:20		15:20				15:20		15:20		
		15:40		15:40				15:40		15:40		
		16:00		16:00				16:00		16:00		
		16:20		16:20				16:20		16:20		
		16:40		16:40				16:40		16:40		
		17:00	Coffee Break	17:00	Coffee Break			17:00	Coffee Break	17:00	Coffee Break	
17:20	Tutorial Sergeyev	17:20	Tutorial Toropov	17:20	Tutorial Natalini			17:20	Announcing the Winner of The Springer Young Researcher Prize and Closing			
18:30	Registration and aperitif	18:20	Discussions	18:20	Discussions							
19:30	Dinner	19:30	Dinner	19:30	Dinner	20:00	Dinner	20:00	Conference Dinner	19:30	Dinner	





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Sunday, June 16, 2019							
Room 1		Room 2		Room 3		Room 4	
09:00	Registration						
09:40	Opening						
10:00	Plenary Lecture Hesthaven						
11:00	Plenary Lecture Deb						
12:00	Conference photo and aperitif						
13:00	Lunch						
15:00	Fukushima	15:00	Pellegrini	15:00	Siettos	15:00	Alassar
15:20	Battiti	15:20	Pirillo	15:20	Russo	15:20	Sahu
15:40	J. Zilinskas	15:40	Serpe	15:40	Giannino	15:40	Patra
16:00	O'Riordan	16:00	Caldarola (n.190)	16:00	Marra	16:00	Raila
16:20	Pizzuti	16:20	Ingarozza	16:20	Spiliotis	16:20	Shukla
16:40	Addawe	16:40	Rizza	16:40	Galaris	16:40	Breuza
17:00	Coffee Break	17:00	Coffee Break	17:00	Coffee Break	17:00	Coffee Break
17:20	Tutorial Sergeyev						
18:20	Discussions						
19:30	Dinner						





# The 3rd International Conference and Summer School Numerical Computations: Theory and Algorithms NUMTA 2019

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## Monday, June 17, 2019

Room 1		Room 2		Room 3		Room 4		Room 5	
09:00	Toraldo	09:00	Lolli	09:00	Caldarola (n.101)	09:00	De Pietro	09:00	Aleksandrov
09:20	Mei			09:20	Bonora	09:20	Demarco	09:20	Khandeev (n.68)
09:40	Kahramanogullari	09:30	Parker	09:40	Carini	09:40	Gabriele	09:40	Danilenko
10:00	Rad	10:00	Rizza	10:00	Pirouz	10:00	Cortese	10:00	Jirawattanapanit
10:20	P. De Luca	10:30	MacLeod	10:20	Palermo	10:20	Murru	10:20	Skatova
10:40	Coffee Break	10:50	Coffee Break	10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break
11:00	Plenary Lecture Formaggia								
12:00	Plenary Lecture Mazzia								
13:00	Lunch								
15:00	A tribute to Strongin	15:00	Barberousse	15:00	Capano	15:00	Bohner	15:00	Tiralongo
15:10	Strongin	15:30	Fillion	15:20	Sinopli	15:20	Kolokolnikov	15:20	Leonardis
15:40	A. Zilinskas	16:00	Visokolskis (n.43)	15:40	Chiaravalloti	15:40	Barilla	15:40	D'Atri
16:00	Lera	16:20	Caterina	16:00	Furnari	16:00	Kanzi	16:00	Botmart
16:20	Gergel	16:40	Visokolskis (n.44)	16:20	Senatore	16:20	Pinjai	16:20	Emharuethai
16:40	Grishagin	17:00	Sochkov	16:40	Napolitano	16:40	Zhukova	16:40	Udpin
17:00	Coffee Break	17:10	Coffee Break	17:00	Coffee Break	17:00	Coffee Break	17:00	Coffee Break
17:20	Tutorial Toropov								
18:20	Discussions								
19:30	Dinner								





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## Tuesday, June 18, 2019

Room 1		Room 2		Room 3		Room 4	
09:00	Dzemyda	09:00	Bubba	09:00	Amodio	09:00	Bagdasar
09:20	Costa	09:20	Bertocchi	09:20	Iavernaro	09:20	Khandeev (n.131)
09:40	Candelieri (n.127)	09:40	Dostal	09:40	Zhigljavsky	09:40	Sarsenova
10:00	Zalinescu	10:00	Benfenati	10:00	Falcone	10:00	Panasenko
10:20	Filatovas	10:20	Rebegoldi	10:20	Mukhametzhanov (n.204)	10:20	Ramachandran
10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break
11:00	Plenary Lecture Zhigljavsky						
12:00	Plenary Lecture De Leone						
13:00	Lunch						
14:30	Excursion						
20:00	Dinner						







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## Wednesday, June 19, 2019

Room 1		Room 2		Room 3		Room 4	
09:00	Erb	09:00	Paulavicius	09:00	Cavallaro	09:00	Crisci
09:20	Cavoretto	09:20	Archetti	09:20	Malhotra	09:20	Franchini
09:40	Fermo	09:40	Ito	09:40	Fiaschi	09:40	Viola
10:00	Fatone	10:00	Di Puglia Pugliese	10:00	Cudazzo	10:00	Perracchione
10:20	Egidi	10:20	Nasso	10:20	Discussions	10:20	Pecha
10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break
11:00	Plenary Lecture Vrahatis						
12:00	Plenary Lecture D'Alotto						
13:00	Lunch						
15:00	Fuduli	15:00	Tamberg	15:00	Perego (n.128)	15:00	Guthrie
15:20	Gaudioso	15:20	Kounchev	15:20	Svetov	15:20	Alfonsi
15:40	Fasano	15:40	Di Tommaso	15:40	Polyakova	15:40	Porfiriev
16:00	Mukhametzhanov (n.206)	16:00	Campagna	16:00	Lochab	16:00	Lauria
16:20	Gillard	16:20	Rossini	16:20	Baranov	16:20	Chernykh
16:40	Cococcioni	16:40	Occorsio	16:40	Discussions	16:40	Upnere
17:00	Coffee Break	17:00	Coffee Break	17:00	Coffee Break	17:00	Coffee Break
17:20	Tutorial Natalini						
18:20	Discussions						
20:00	Conference Dinner						





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## Thursday, June 20, 2019

Room 1		Room 2		Room 3		Room 4	
09:00	Garloff	09:00	Francomano	09:00	Macha	09:00	Discussions
09:20	Bünger	09:20	De Rossi	09:20	Valaitis	09:20	
09:40	Posypkin	09:40	Dell'Accio	09:40	D. De Luca	09:40	
10:00	Zykina	10:00	Geum	10:00	Aksyonov	10:00	
10:20	Mullier	10:20	Makarov	10:20	Sharma	10:20	
10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break
11:00	Giordano (n.181)	11:00	Aceto	11:00	Uteshev	11:00	Discussions
11:20	Folino	11:20	Volkov	11:20	Palkar	11:20	
11:40	De Rango	11:40	Teodoro	11:40	Sharun	11:40	
12:00	Primavera	12:00	Koustousova	12:00	Di Gregorio	12:00	
12:20	Utrera	12:20	Singh	12:20	Cuomo	12:20	
12:40	D'Ambrosio	12:40	Korotchenko	12:40	Khachay	12:40	
13:00	Lunch						
15:00	Spataro (n.182)	15:00		15:00	Wongprachan	15:00	Discussions
15:20	Calidonna	15:20	Round Table	15:20	Edalat	15:20	
15:40	Vinci	15:40	on the developments in the	15:40	Hammachukiattikul	15:40	
16:00	Cannataro	16:00	Infinity Computing	16:00	Mehandiratta	16:00	
16:20	Sapetina	16:20	Methodology	16:20	Srisuksomwong	16:20	
16:40	Forestiero	16:40		16:40	Iudin	16:40	
17:00	Coffee Break	17:00	Coffee Break	17:00	Coffee Break	17:00	Coffee Break
17:20	Announcing the Winner of The Springer Young Researcher Prize Closing						
19:30	Dinner						







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## Talks related to the Infinity Computing

Sunday, June 16		Monday, June 17		Tuesday, June 18		Wednesday, June 19		Thursday, June 20	
09:00	Registration	09:00	Lolli (Room 2)	09:00		09:00		09:00	
09:40	Opening			09:20	Iavernaro (Room 3)	09:20		09:20	
10:00		09:30	Parker (Room 2)	09:40	Zhigljavsky (Room 3)	09:40	Fiaschi (Room 3)	09:40	
		10:00	Rizza (Room 2)	10:00	Falcone (Room 3)	10:00	Cudazzo (Room 3)	10:00	
		10:20		10:20	Mukhametzhanov (Room 3)	10:20		10:20	
		10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break
11:00		11:00		11:00	Plenary Lecture Zhigljavsky	11:00		11:00	
								11:20	
								11:40	
12:00		12:00	Plenary Lecture Mazzia	12:00	Plenary Lecture De Leone	12:00	Plenary Lecture D'Alotto	12:00	
								12:20	
								12:40	
13:00	Lunch								
15:00		15:00		14:30	Excursion	15:00		15:00	
15:20		15:20				15:20		15:20	Round Table
15:40		15:40				15:40	Fasano (Room 1)	15:40	on the developments in the
16:00	Caldarola (Room 2)	16:00				16:00	Mukhametzhanov (Room 1)	16:00	Infinity Computing
16:20	Ingarozza (Room 2)	16:20				16:20		16:20	Methodology
16:40	Rizza (Room 2)	16:40				16:40		16:40	
17:00	Coffee Break	17:00	Coffee Break			17:00	Coffee Break	17:00	Coffee Break
17:20	Tutorial Sergeyev	17:20				17:20		17:20	
18:20	Discussions	18:20	Discussions			18:20	Discussions	18:20	
19:30	Dinner	19:30	Dinner	20:00	Dinner	20:00	Conference Dinner	19:30	Dinner





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## NUMTA 2019 – DETAILED PROGRAM (June 15 – 21, 2019)

### NUMTA 2019 PLENARY LECTURES AND TUTORIALS

#### June 15, Saturday (Arrival day)

18.30 - 19.30	<i>Registration and Aperitif</i>
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#### June 16, Sunday

9.00 – 9.40	<i>Registration</i>
9.40 – 10.00	<i>Opening</i>
<b>Chairman: Luca Formaggia</b>	
10.00 – 11.00	Plenary: <b>Jan Hesthaven</b> and Deep Ray, Precision algorithms
11.00 – 12.00	Plenary: <b>Kalyanmoy Deb</b> , Karush-Kuhn-Tucker proximity measure for convergence of real-parameter single and multi-objective optimization
	<i>Conference photo and aperitif</i>
	<i>Lunch</i>
15.00 – 17.00	Parallel sessions
	<i>Coffee break</i>
<b>Chairman: Renato De Leone</b>	
17.20 – 18.20	Tutorial: <b>Yaroslav Sergeyev</b> , Grossone-based Infinity Computing with numerical infinities and infinitesimals
	<i>Discussions</i>





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**June 17, Monday**

9.00 – 10.40	Parallel sessions
	<i>Coffee break</i>
<b>Chairman: Michael Vrahatis</b>	
11.00 – 12.00	Plenary: <b>Luca Formaggia</b> and Anna Scotti, Numerical modeling of flow in fractured porous media and fault reactivation
12.00 – 13.00	Plenary: <b>Francesca Mazzia</b> , Numerical differentiation on the Infinity Computer and applications for solving ODEs and approximating functions
	<i>Lunch</i>
15.00 – 17.00	Parallel sessions
	<i>Coffee break</i>
<b>Chairman: Anatoly Zhigljavsky</b>	
17.20 – 18.20	Tutorial: <b>Vassili Toporov</b> , Design optimization techniques for industrial applications: challenges and progress
	<i>Discussions</i>

**June 18, Tuesday**

9.00 – 10.40	Parallel sessions
	<i>Coffee break</i>
<b>Chairman: Yaroslav Sergeyev</b>	
11.00 – 12.00	Plenary: <b>Anatoly Zhigljavsky</b> , Uniformly distributed sequences and space-filling
12.00 – 13.00	Plenary: <b>Renato De Leone</b> , Recent advances on the use of Grossone in optimization and regularization problems
	<i>Lunch</i>
	<i>Excursion</i>





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## June 19, Wednesday

9.00 – 10.40	Parallel sessions
	<i>Coffee break</i>
<b>Chairman: Jan Hesthaven</b>	
11.00 – 12.00	Plenary: <b>Michael Vrahatis</b> , Generalizations of the intermediate value theorem for approximations of points and zeroes of continuous functions
12.00 – 13.00	Plenary: <b>Lou D’Alotto</b> , Infinite Games on Finite Graphs using Grossone
	<i>Lunch</i>
15.00 – 17.00	Parallel sessions
	<i>Coffee break</i>
<b>Chairman: Vassili Toporov</b>	
17.20 – 18.20	Tutorial: Roberta Bianchini and <b>Roberto Natalini</b> , Vector kinetic approximations to fluid-dynamics equations
	<i>Discussions</i>

## June 20, Thursday

9.00 – 10.40	Parallel sessions
	<i>Coffee break</i>
11.00 – 13.00	Parallel sessions
	<i>Lunch</i>
15.00 – 17.00	Parallel sessions
	<i>Coffee break</i>
17.20	Announcing the Winner of The Springer Young Researcher Prize and Closing





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## NUMTA 2019 PARALLEL SESSIONS: JUNE 16 (SUNDAY)

### June 16, Sunday afternoon (15.00): Room 1

Title: Optimization and Evolutionary Computation	
Chairman: <b>Kalyanmoy Deb</b>	
15.00 – 15.20	<b>Fukushima Masao</b> , Computing Stationary Equilibria in Multi-Leader-Follower Games
15.20 – 15.40	<b>Battiti Roberto</b> and Brunato Mauro, Intelligent Management Systems in Hotels: Machine Learning Meets Optimization Heuristics
15.40 – 16.00	<b>Zilinskas Julius</b> , Lancinskas Algirdas, Fernandez Pascual, Pelegrin Blas, Ranking-based Discrete Optimization Algorithm for Asymmetric Competitive Facility Location
16.00 – 16.20	<b>O’Riordan Emily</b> , Gillard Jonathan, Zhigljavsky Anatoly, On simplicial distances with a view to applications in statistics
16.20 – 16.40	<b>Pizzuti Clara</b> , Socievole Annalisa, Epidemic spreading curing strategy over directed networks
16.40 – 17.00	<b>Corsino-Addawe Rizavel</b> , Stability of DESA Optimization Algorithm and its Application to time series Susceptible-Infected-Recovered models

### June 16, Sunday afternoon (15.00): Room 2

Title: Pythagorean stream “Numbers, Algorithms and Applications” (part 1)	
Chairman: <b>Nadir Murru</b>	
15.00 – 15.20	<b>Pellegrini Marco</b> , Caldarola Fabio and D’Atri Gianfranco, Some results about n-sets
15.20 – 15.40	<b>Pirillo Giuseppe</b> , Caldarola Fabio, D’Atri Gianfranco, Maiolo Mario, The Carboncettus quasi-regular octagon and other polygons
15.40 – 16.00	<b>Serpe Annarosa</b> , A computational approach with MATLAB software for equation root finding in High School Maths
16.00 – 16.20	<b>Caldarola Fabio</b> , Antoniotti Luigi, D’Atri Gianfranco, Leonardis Antonino and Pellegrini Marco, New approaches to basic calculus: an experimentation via numerical computation
16.20 – 16.40	<b>Ingarozza Francesco</b> , Adamo Maria Teresa, Martino Maria, Piscitelli Aldo and Caldarola Fabio, A symbolic model for infinitesimal calculus
16.40 – 17.00	<b>Rizza Davide</b> , The Arithmetic of Infinity within the continuum of enquiry: experiences in schools





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## June 16, Sunday afternoon (15.00): Room 3

Title: Special session “Numerical Analysis of Complex and Multiscale Systems”	
Chairman: <b>Russo Lucia</b>	
15.00 – 15.20	<b>Siettos Constantinos, Russo Lucia</b> , Numerical approximation of center, stable and unstable manifolds of multiscale/stochastic systems
15.20 – 15.40	<b>Russo Lucia</b> , Mancusi Erasmo and Siettos Constantinos, The dynamics of a ring network with switched connections
15.40 – 16.00	<b>Giannino Francesco</b> , Spiliotis Konstantinos, Siettos Constantinos and Russo Lucia, Pattern formation and numerical bifurcation analysis for a vegetation model
16.00 – 16.20	Acampora Luigi and <b>Marra Francesco Saverio</b> , Numerical Algorithms for the Parametric Continuation of Stiff ODEs deriving from the Modeling of Combustion with Detailed Chemical Mechanisms
16.20 – 16.40	<b>Spiliotis Konstantinos</b> , Russo Lucia, Giannino Francesco, Siettos Constantinos, Effect of human interaction on forest-grassland dynamics: a numerical bifurcation analysis
16.40 – 17.00	<b>Galaris Evangelos</b> and Siettos Constantinos, Modelling and Analysis of Functional Connectivity in EEG source level in Children with Epilepsy

## June 16, Sunday afternoon (15.00): Room 4

Title: Computational models	
Chairman: <b>Aleksandrov Aleksander</b>	
15.00 – 15.20	<b>Alassar Rajai</b> , Preserving Stone Fruits
15.20 – 15.40	<b>Sahu Abhilash</b> , Priyadarshi Amit, A system of p-Laplacian equations on the Sierpinski gasket
15.40 – 16.00	<b>Patra Suchismita</b> , Kumar V.V.K Srinivas, Finding Multiple Solutions to a Class of p-Laplace Problems Using Newton's Method
16.00 – 16.20	<b>Raila Tomas</b> , Meskauskas Tadas, Valincius Gintaras, Jankunec Marija, Penkauskas Tadas, Computer modeling of electrochemical impedance spectra for defected phospholipid membranes: finite element analysis
16.20 – 16.40	<b>Shukla Ankita</b> , Mehra Mani, Compact filter regularization and error estimate for solving sideways heat equation
16.40 – 17.00	<b>Marchetti Filippo</b> , Breuza Emanuele, Colombo Giorgio, Gregori Daniele, Molecular Dynamics Performance Evaluation with Modern Computer Architecture







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## NUMTA 2019 PARALLEL SESSIONS: JUNE 17 (MONDAY)

### June 17, Monday morning (9.00): Room 1

Title: Special session “Computational Methods for data analysis”	
Chairman: <b>Rosanna Campagna</b>	
9.00—9.20	Romano Annalisa, Rosanna Campagna, Paolo Masi and <b>Gerardo Toraldo</b> , Numerical approach for NMR-based analysis of water mobility in wheat flour dough
9.20—9.40	<b>Mei Gang</b> , Gao Kaifeng , Cuomo Salvatore and Piccialli Francesco, Adaptive RBF Interpolation for Estimating Missing Values in Geographical Big Data
9.40—10.00	<b>Kahramanogullari Ozan</b> and Hancyzc Martin, Stochastic Mechanisms of Information Flow in Phosphate Economy of Escheria Coli
10.00—10.20	<b>Rahnama Rad Kamiar</b> , Approximate leave-one-out cross-validation for nonparametric Bayesian Gaussian Process methods with applications to neural data
10.20—10.40	<b>De Luca Pasquale</b> , Galletti Ardelio, Giunta Giulio, Marcellino Livia and Raei Marzie, Performance analysis of a multicore implementation for solving a two-dimensional inverse anomalous diffusion problem

### June 17, Monday morning (9.00): Room 2

Title: Special stream “Philosophy of Mathematics: Applicability, Practice, and Numerical Computations” (part 1)	
Chairman: <b>Rizza Davide</b>	
9.00—9.30	<b>Lolli Gabriele</b> , A comparison of new approaches to infinity
9.30—10.00	<b>Matthew Parker</b> , Applied Infinity: Accuracy and Artefact
10.00—10.30	<b>Rizza Davide</b> , Bijections and Euclidean set-size measures
10.30—10.50	<b>MacLeod Miles</b> , Re-evaluating the role of mathematics in biology: Is systems biology a break with the past?





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## June 17, Monday morning (9.00): Room 3

Title: Special stream "Optimization and Management of Water Supply" (part 1)	
Chairman: <b>Piro Patrizia</b>	
9.00—9.20	<b>Caldarola Fabio</b> and Maiolo Mario, A useful mathematical framework acting on a new set of local indices for urban water networks
9.20—9.40	<b>Bonora Marco Amos</b> , Caldarola Fabio, Muranho Joao, Sousa Joaquim and Maiolo Mario, Numerical experimentations for a new set of local indices of a water network
9.40—10.00	<b>Carini Manuela</b> , Bonora Marco Amos, Capano Gilda, Cotrone Rocco, Pantusa Daniela, Sousa Joaquim and Maiolo Mario, Performance management of demand and pressure drive analysis in a monitored water distribution network
10.00—10.20	<b>Pirouz Behrouz</b> , Palermo Stefania Anna, Turco Michele and Piro Patrizia, New Mathematical Optimization Approaches for LID Systems under Fuzzy Environment
10.20—10.40	<b>Palermo Stefania Anna</b> , Talarico Vito Cataldo and Pirouz Behrouz, Optimizing rainwater harvesting systems for non-potable water uses and surface runoff mitigation

## June 17, Monday morning (9.00): Room 4

Title: Pythagorean stream "Numbers, Algorithms and Applications" (part 2)	
Chairman: <b>Caldarola Fabio</b>	
9.00—9.20	<b>De Pietro Michela</b> , Bertacchini Francesca, Pantano Pietro and Bilotta Eleonora, Modelling on human intelligence a machine learning system
9.20—9.40	<b>Demarco Francesco</b> , Bertacchini Francesca, Scuro Carmelo, Bilotta Eleonora and Pantano Pietro, Algorithms for Jewelry Industry 4.0
9.40—10.00	<b>Gabriele Lorella</b> , Bertacchini Francesca, Giglio Simona, Menniti Daniele, Pantano Pietro, Piannarelli Anna, Sorrentino Nicola and Bilotta Eleonora, Clustering analysis to profile customers behaviour in POWER CLOUD energy community
10.00—10.20	<b>Cortese Domenico</b> , Caldarola Fabio and D'Atri Gianfranco, From the ancient Pythagorean School to contemporary mathematical models: paradoxes of the infinite and ontological dilemmas
10.20—10.40	<b>Murru Nadir</b> , Bellini Emanuele, A multi-factor RSA-like scheme with fast decryption based on Rédei rational functions over the Pell hyperbola





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## June 17, Monday morning (9.00): Room 5

Title: Nonlinear systems	
Chairman: <b>Volkov Yuriy</b>	
9.00—9.20	<b>Aleksandrov Alexander</b> , Conditions of the Stability Preservation under Discretization of a Class of Nonlinear Time-Delay Systems
9.20—9.40	<b>Khandeev Vladimir</b> , Polynomial-Time Approximation Scheme for a Problem of Searching for the Largest Subset
9.40—10.00	<b>Danilenko Olga</b> , Rasina Irina, The approximate synthesis of optimal control for heterogeneous discrete systems with intermediate criteria
10.00—10.20	<b>Jirawattanapanit Anuwat</b> , Effect of Education Campaign on Mathematical Model SEIR for Controlling the Spread of Chickenpox
10.20—10.40	<b>Skatova Ekaterina</b> , La Rocca Maurizio, On an effective usage of numerical infinities and infinitesimals in economic models

## June 17, Monday afternoon (15.00): Room 1

Title: Global Optimization (part 1)	
Chairman: <b>Sergeyev Yaroslav</b>	
15.00--15.10	<b>Gergel Victor</b> , A tribute to Professor Roman G. Strongin
15.10—15.40	<b>Strongin Roman</b> , Barkalov Konstantin, Bevzuk Semen, Acceleration of global search through dual Lipschitz constant estimates
15.40—16.00	<b>Žilinskas Antanas</b> , On some challenges in Bayesian global optimization
16.00—16.20	<b>Lera Daniela</b> , Posypkin Mikhail, Sergeyev Yaroslav, Approximating the solution set of nonlinear inequalities by using Peano space-filling curves
16.20—16.40	<b>Gergel Victor</b> , Goryachikh Alexey, Multidimensional global search using numerical estimations of minimized function derivatives and adaptive nested optimization scheme
16.40—17.00	<b>Grishagin Vladimir</b> , Israfilov Ruslan, Adaptive Nested Multiextremal Optimization in Accessible Region with Computable Boundaries





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## June 17, Monday afternoon (15.00): Room 2

Title: Special stream "Philosophy of Mathematics: Applicability, Practice, and Numerical Computations" (part 2)	
Chairman: <b>Parker Matthew</b>	
15.00--15.30	<b>Barberousse Anouk</b> , On the notion of mathematical formalism
15.30—16.00	<b>Fillion Nicolas</b> , Concepts of approximate solutions and the finite element method
16.00—16.20	<b>Visokolskis Sandra</b> and Trillini Carla, In Quest for Invariant Structures through Graph Theory, Groups and Mechanics: Methodological Aspects in the History of Applied Mathematics
16.20—16.40	<b>Caterina Gianluca</b> and Gangle Rocco, A new syntax for diagrammatic logic: a generic figures approach
16.40—17.00	<b>Visokolskis Sandra</b> and Gervan Hector Horacio, Applied versus Situated Mathematics in Ancient Egypt: Bridging the Gap between Theory and Practice
17.00--17.10	<b>Sochkov Andrey</b> , Affinity of views of Florenskij and Sergeyev on numeral systems and their applications in mathematics and computer science

## June 17, Monday afternoon (15.00): Room 3

Title: Special stream "Optimization and Management of Water Supply" (part 2)	
Chairman: <b>Mendicino Giuseppe</b>	
15.00--15.10	<b>Capano Gilda</b> , Bonora Marco Amos, Carini Manuela and Maiolo Mario, Identification of Contamination Potential Source (ICPS) : a topological approach for the optimal recognition of sensitive nodes in a water distribution network.
15.10—15.40	<b>Sinopoli Salvatore</b> , Bonora Marco Amos, Capano Gilda, Carini Manuela, Pantusa Daniela and Maiolo Mario, Optimization of submarine outfalls with a multiport diffuser design.
15.40—16.00	<b>Chiaravalloti Francesco</b> , Bonora Marco Amos, Capano Gilda, Carini Manuela, Pantusa Daniela, Sousa Joaquim and Maiolo Mario, Optimization model for water distribution network planning in a realistic orographic framework
16.00—16.20	<b>Furnari Luca</b> , Senatore Alfonso and Mendicino Giuseppe, Seeking for a trade-off between accuracy and timeliness in meteo-hydrological modeling chains
16.20—16.40	<b>Senatore Alfonso</b> , Fuoco Domenico, Sanna Antonella, Borrelli Andrea, Mendicino Giuseppe and Gualdi Silvio, Evaluation of an integrated seasonal forecast system for agricultural water management in Mediterranean regions
16.40—17.00	<b>Napolitano Jacopo</b> and Sechi Giovanni Maria, Scenario optimization in complex water supply systems for energy saving and a correct management under uncertainty





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## June 17, Monday afternoon (15.00): Room 4

Title: Special session "Variational Analysis and Optimization Methods with Applications in Finance and Economics"	
Chairman: <b>Caristi Giuseppe</b>	
15.00--15.20	<b>Bohner Martin</b> , Dynamic Risk Aversion and Risk Vulnerability
15.20—15.40	<b>Kolokolnikov Theodore</b> , Agent-based models of spatial aggregation and their continuum limits
15.40—16.00	<b>Heidarkhani Shapour</b> , Barilla David and Caristi Giuseppe, Discrete Models for Dynamic Competitive Economic Equilibrium Problems
16.00—16.20	<b>Kanzi Nader</b> , Barilla David and Caristi Giuseppe, Qualifications and stationary conditions for nonsmooth multiobjective mathematical programming problem with vanishing constraints
16.20—16.40	<b>Pinjai Sirada</b> , Delay-dependent on Robust Exponential Stability Analysis and $H^\infty$ Performance for Uncertain Neutral Time-varying Delays Systems
16.40—17.00	<b>Zhukova Aleksandra</b> , Pospelov Igor, A model of optimal consumption and borrowing with random time scale

## June 17, Monday afternoon (15.00): Room 5

Title: Pythagorean stream "Numbers, Algorithms and Applications" (part 3)	
Chairman: <b>Serpe Annarosa</b>	
15.00--15.20	<b>Tiralongo Sabrina</b> , Serpe Annarosa, A problem-solving approach to Diophantine equations in Math education contest
15.20—15.40	<b>Leonardis Antonino</b> , D'Atri Gianfranco and Caldarola Fabio, A geometrical proof for generalized Goodstein's theorem
15.40—16.00	<b>D'Atri Gianfranco</b> , Le Van Thanh, Garri' Gerardino, D'Atri Stella, Numerical problems in XBRL reports and the use of blockchain as trust enabler
16.00—16.20	<b>Botmart Thongchai</b> and Weera Wajaree, Novel pinning adaptive intermittent control for finite-time function projective synchronization of delayed nonlinear complex dynamical networks with hybrid coupling
16.20—16.40	<b>Emharuethai Chanikan</b> , Niamsup Piyapong, Finite-time stability for neural networks with time varying delay based on an improved reciprocally convex inequality
16.40—17.00	<b>Udpin Sasithorn</b> , Suntonsinsoungvon Eakachai, Robust $H^\infty$ control for polytopic uncertainties discrete-time neural networks with leakage time-varying delay







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## NUMTA 2019 PARALLEL SESSIONS: JUNE 18 (TUESDAY)

### June 18, Tuesday morning (9.00): Room 1

Title: Global Optimization (part 2)	
Chairman: <b>Strongin Roman</b>	
9.00—9.20	<b>Dzemyda Gintautas</b> , Sabaliauskas Martynas, A Novel Geometric Approach to the Problem of Multidimensional Scaling
9.20—9.40	<b>Costa M. Fernanda P.</b> , Rocha A.M.A.C., Fernandes E.M.G.P., Objective and Violation Upper Bounds on a DIRECT-filter Method for Global Optimization
9.40—10.00	<b>Candelieri Antonio</b> , Archetti Francesco, Bayesian Optimization of partially defined functions under unknown constraints: approximating feasible region boundary via Support Vector Machine
10.00—10.20	<b>Zalinescu Constantin</b> , On unconstrained optimization problems solved using CDT and triality theory
10.20—10.40	<b>Filatovas Ernestas</b> , Kurasova O., Moreno J.J., Garzon E.M., Miroforidis J., Podkopaev D., Kaliszewski I., High-performance algorithms for large-scale multiobjective radiotherapy planning problems

### June 18, Tuesday morning (9.00): Room 2

Title: Special session “First Order Methods in Optimization: Theory and Applications” (part 1)	
Chairman: <b>Viola Marco</b>	
9.00—9.20	<b>Bubba Tatiana Alessandra</b> , Kutyniok Gitta, Lassas Matti, März Maximilian, Samek Wojciech, Siltanen Samuli and Srinivasan Vignesh, Learning the Invisible: Limited Angle Tomography, Shearlets and Deep Learning
9.20—9.40	<b>Bertocchi Carla</b> , Corbineau Marie-Caroline, Chouzenoux Emilie, Prato Marco and Pesquet Jean-Cristophe, A Neural Network Approach for Parameters Estimation in Image Deblurring
9.40—10.00	<b>Dostal Zdenek</b> and Vlach Oldrich, Augmented Lagrangians with adaptive augmentation for bound and equality constrained quadratic programming problems
10.00—10.20	<b>Benfenati Alessandro</b> , Chouzenoux Emilie and Pesquet Jean-Christophe, Proximal Approaches for Matrix Estimation Problems
10.20—10.40	<b>Rebegoldi Simone</b> , Prato Marco and Bonettini Silvia, Convergence of an inexact forward-backward method for nonconvex nonsmooth problems







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## June 18, Tuesday morning (9.00): Room 3

Title: Infinity Computer	
Chairman: <b>Cococcioni Marco</b>	
9.00—9.20	<b>Amodio Pierluigi</b> and Settanni Giuseppina, A Matlab code for the numerical solution of Multiparameter Spectral Problems
9.20—9.40	<b>Iavernaro Felice</b> , Amodio Pierluigi, Brugnano Luigi, Mazzia Francesca, A dynamic precision floating-point arithmetic based on the Infinity Computer framework
9.40—10.00	<b>Zhigljavsky Anatoly</b> , Potential usefulness of the Grossone and Infinity Computer in probability
10.00—10.20	<b>Falcone Alberto</b> , Garro Alfredo, Mukhametzhonov Marat, Sergeyev Yaroslav, A Simulink-based Infinity Computer simulator and some applications
10.20—10.40	<b>Mukhametzhonov Marat</b> , Kvasov Dmitri, Sergeyev Yaroslav, On the Exact Higher Order Differentiation Techniques on the Infinity Computer

## June 18, Tuesday morning (9.00): Room 4

Title: Machine Learning	
Chairman: <b>Vrahatis Michael</b>	
9.00--9.20	<b>Bagdassar Ovidiu</b> , O'Neil Sam and Liotta Antonio, A Reinforcement Learning Approach to a Multi-agent N-armed Functional Bandit
9.20—9.40	<b>Khandeev Vladimir</b> , Kelmanov Aleksander, Exact Parameterized Linear-Time Algorithm for K-Means Problem with Optimized Number of Clusters for the 1D Case
9.40—10.00	Seidakhmetova Kalamkas , Bayekova Gulaiym, <b>Sarsenova Zhibek</b> , Kuandykov Abu, Duisebekova Kulanda, Satybaldiyeva Ryskhan, Analysis of systems for operational data processing based on Big Data and their practical application
10.00—10.20	<b>Panasenko Anna</b> , Kelmanov Alexander, Khamidullin Sergey, An Approximation Polynomial-Time Algorithm for One Hard-to-Solve Weighted 2-Partitioning Problem of a Sequence
10.20—10.40	<b>Ramachandran Raja</b> , Unyong Bundit , Rajchakit Grienggrai, Pratap Anbalagan, Improved less conservative stability criteria for stochastic uncertain discrete-time neural networks with mixed delays and an impulse





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## NUMTA 2019 PARALLEL SESSIONS: JUNE 19 (WEDNESDAY)

### June 19, Wednesday morning (9.00): Room 1

Title: Special stream "Approximation: methods, algorithms and applications" (part 1)	
Chairman: <b>Dell'Accio Francesco</b>	
9.00—9.20	<b>Erb Wolfgang</b> , De Marchi Stefano, Marchetti Francesco, Perracchione Emma and Rossini Milvia, Edge-driven interpolation with discontinuous kernels and applications in medical imaging
9.20—9.40	<b>Cavoretto Roberto</b> , De Rossi Alessandra, An Adaptive Refinement Scheme for Radial Basis Function Collocation
9.40—10.00	<b>Fermo Luisa</b> , Diaz de Alba Patricia and Rodriguez Giuseppe, Gauss and anti-Gauss quadrature rules applied to integral equations of the second kind
10.00—10.20	<b>Fatone Lorella</b> , Egidi Nadaniela and Misici Luciano, A new Remez-type algorithm for best polynomial approximation
10.20—10.40	<b>Egidi Nadaniela</b> , Maponi Pierluigi, A SVE approach for the numerical solution of ordinary differential equations

### June 19, Wednesday morning (9.00): Room 2

Title: Global Optimization (part 3)	
Chairman: <b>Archetti Francesco</b>	
9.00—9.20	<b>Paulavičius Remigijus</b> , Adjiman Claire, An enhanced BASBL solver for bilevel problems
9.20—9.40	Canderieri Antonio, Galluzzi Bruno, Giordani Ilaria, <b>Archetti Francesco</b> , Are humans Bayesian in the optimization of black-box functions?
9.40—10.00	<b>Ito Keiichi</b> , Ensemble Modeling for Minimization of Noisy Expensive Functions
10.00—10.20	<b>Di Puglia Pugliese Luigi</b> , Guerriero Francesca, Granat Janusz, An efficient optimal solution approach for the preference-based multicriteria shortest path problem with reference points
10.20—10.40	<b>Nasso Maria Chiara</b> , Mukhametzhanov Marat, Kvasov Dmitri, Sergeyev Yaroslav, On Acceleration of Derivative-Free Univariate Lipschitz Global Optimization Methods





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**June 19, Wednesday morning (9.00): Room 3**

Title: Springer Young Researcher Prize	
Chairman: <b>Grishagin Vladimir</b>	
9.00—9.20	<b>Cavallaro Lucia</b> , Bagdassar Ovidiu, De Meo Pasquale, Fiumara Giacomo, Liotta Antonio, Network Science Strategies for Accelerating the Training of Artificial Neural Networks
9.20—9.40	<b>Malhotra Tanya</b> , Gupta Anjana, Singh Anjali, Methodology for interval-valued matrix games with 2-tuple fuzzy linguistic information
9.40—10.00	<b>Fiaschi Lorenzo</b> , Cococcioni Marco, Non-Archimedean Game Theory and the Infinity Computer: a Numerical Approach
10.00—10.20	Cococcioni Marco, <b>Cudazzo Alessandro</b> , Pappalardo Massimo, Sergeyev Yaroslav, Approaching Lexicographic Mixed-Integer Linear Programming Problems Using Grossone Methodology
10.20—10.40	Discussions

**June 19, Wednesday morning (9.00): Room 4**

Title: Special session “First Order Methods in Optimization: Theory and Applications” (part 2)	
Chairman: <b>Rebegoldi Simone</b>	
9.00—9.20	<b>Crisci Serena</b> , Porta Federica, Ruggiero Valeria and Zanni Luca, Barzilai-Borwein rules in gradient projection methods: a redefinition for special constrained problems
9.20—9.40	<b>Franchini</b> Giorgia and Zanni Luca, On the steplength selection in Stochastic Gradient Methods
9.40—10.00	<b>Viola Marco</b> , Di Serafino Daniela and Toraldo Gerardo, A Barzilai-Borwein-based globalization strategy for the BFGS method
10.00—10.20	<b>Perracchione Emma</b> , Data-based models for satellite images
10.20—10.40	<b>Pecha Marek</b> , Horak David, Adapting MPRGP Algorithm for Supervised Modelling of Biochemical Activities Employing SVM Classification





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## June 19, Wednesday afternoon (15.00): Room 1

Title: Optimization and Grossone	
Chairman: <b>De Leone Renato</b>	
15.00--15.20	<b>Fuduli Antonio</b> , Astorino Annabella, Avolio Matteo, A Spherical Separation Approach for Multiple Instance Learning
15.20—15.40	<b>Gaudio Manlio</b> , Giallombardo Giovanni, Miglionico Giovanna, MINLP formulations of the Feature Selection problem in SVM framework
15.40—16.00	<b>Fasano Giovanni</b> , Issues on Large Symmetric Indefinite Linear Systems and Grossone
16.00—16.20	<b>Mukhametzhonov Marat</b> , Kvasov Dmitri, Sergeyev Yaroslav, Handling Ill-Conditioning in Some Optimization Problems via Infinity Computing
16.20—16.40	<b>Gillard Jonathan</b> , Usevich Konstantin, Convex Optimization for Structured Matrix Completion
16.40—17.00	<b>Cococcioni Marco</b> , An Efficient Solution to a Series of Weighted Least Squares Problems if Only Weights Vary

## June 19, Wednesday afternoon (15.00): Room 2

Title: Special stream “Approximation: methods, algorithms and applications” (part 2)	
Chairman: <b>Francomano Elisa</b>	
15.00--15.20	<b>Tamberg Gert</b> and <b>Graf Olga</b> , On some applications of generalized Kantorovich sampling operators
15.20—15.40	<b>Kounchev Ognian</b> , On non-parametric regressions by means of multivariate polysplines
15.40—16.00	<b>Di Tommaso Filomena</b> , Dell'Accio Francesco, Comparison of Shepard's like methods with different basis functions
16.00—16.20	<b>Campagna Rosanna</b> , Conti Costanza, Cuomo Salvatore, Laplace Transform Inversion for multiexponential decay data by smoothing L-splines
16.20—16.40	<b>Rossini Milvia</b> , Arandiga Francesc, Donat Rosa and Romani Lucia, Recovering discontinuous functions via MQ-RBF local interpolation with ENO/WENO estimate of the shape parameter
16.40—17.00	<b>Occorsio Donatella</b> , Woula Themistoclakis, Weighted polynomial approximation on the square by de la Vallée Poussin means





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**June 19, Wednesday afternoon (15.00): Room 3**

Title: Applications	
Chairman: <b>D'Alotto Lou</b>	
15.00--15.20	Canderlieri Antonio and <b>Perego Riccardo</b> , Dimensionality Reduction methods to scale Bayesian Optimization up
15.20—15.40	<b>Svetov Ivan</b> , Maltseva Svetlana V., Louis Alfred K., The method of approximate inverse in slice-by-slice vector tomography problems
15.40—16.00	<b>Polyakova Anna</b> , Hahn Bernadette N., The singular value decomposition of the operator of the dynamic ray transform acting on 2D vector fields
16.00—16.20	<b>Lochab Ruchika</b> , Kumar Vivek, Numerical simulation of Hyperbolic conservation laws using high Resolution schemes with the indulgence of Fuzzy logic
16.20—16.40	<b>Baranov Nicolay</b> , Algorithms of 3D wind field reconstructing by lidar remote sensing data
16.40—17.00	Discussions

**June 19, Wednesday afternoon (15.00): Room 4**

Title: Computational fluid dynamics	
Chairman: <b>Hesthaven Jan</b>	
15.00--15.20	<b>Guthrie Roderick</b> , Isac Mihaiela, Fluid Flow and Meniscus Behavior during Horizontal Single Belt Casting (HSBC) of Aluminum Strips
15.20—15.40	<b>Lauria Agostino</b> , Alfonsi Giancarlo, Ferraro Domenico, Gaudio Roberto, Numerical Investigation Of Natural Rough-Bed Flow
15.40—16.00	<b>Porfiriev Denis</b> , Kurushima Svetlana, Molevich Nonna, Zavershinsky Igor, Numerical investigation into a combined ecologically pure plasma-vortex generator of hydrogen and thermal energy
16.00—16.20	<b>Lauria Agostino</b> , Alfonsi Giancarlo, Numerical Simulation of Ski-Jump Hydraulic Behavior
16.20—16.40	<b>Chernykh Igor</b> , Kulikov Igor, Protasov Victor, Numerical simulation of astrophysical and astrochemical problems on supercomputers
16.40—17.00	<b>Upnere Sabine</b> , Bezrukovs Valerijs, Bezrukovs Vladislavs, Jekabsons Normunds, Gulbe Linda, Computational Fluid Dynamics Methods for Wind Resources Assesment







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### June 20, Thursday morning (9.00): Room 1

Title: Interval Analysis and Applications	
Chairman: <b>Garloff Jürgen</b>	
9.00—9.20	<b>Garloff Jürgen</b> , Titi Jihad, Enclosure of the Range of a Complex Polynomial Over a Complex Interval
9.20—9.40	<b>Bünger Florian</b> , Verified solution of ODEs by Taylor models implemented in MATLAB/INTLAB
9.40—10.00	<b>Posypkin Mikhail</b> , Gorbunov Alexei, A massively parallel Lipschitzian global optimizer
10.00—10.20	<b>Zykina Anna</b> , Kaneva Olga, Savkin Vladimir, Fink Tatyana, Formulation of the preparation problem of a commercial product batch under uncertainty
10.20-10.40	<b>Mullier Olivier</b> , Alexandre Dit Sandretto Julien, Set-membership computation of integrals with uncertain endpoints

### June 20, Thursday morning (9.00): Room 2

Title: Special stream “Approximation: methods, algorithms and applications” (part 3)	
Chairman: <b>Occorsio Donatella</b>	
9.00—9.20	<b>Francomano Elisa</b> , Antonelli Laura, di Serafino Daniela, Gregoretti Francesco and Paliaga Marta, Advanced numerical treatment of an accurate SPH method
9.20—9.40	<b>De Rossi Alessandra</b> , Cavoretto Roberto, Dell'Accio Francesco and Di Tommaso Filomena, A 3D efficient procedure for Shepard interpolants on tetrahedra
9.40—10.00	<b>Dell'Accio Francesco</b> , Di Tommaso Filomena, Interpolation by bivariate quadratic polynomials and applications to the scattered data interpolation problem
10.00—10.20	<b>Geum Young Hee</b> , On a Family of Fourth-order Simple-root Finders
10.20—10.40	<b>Makarov Anton</b> , On Faber's type decomposition for minimal spline spaces







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**June 20, Thursday morning (9.00): Room 3**

Title: Optimization and Applications	
Chairman: <b>Žilinskas Julius</b>	
9.00—9.20	<b>Macha Vaclav</b> , Adam Lukas, Smidl Vaclav, General framework for binary nonlinear classification on top samples
9.20—9.40	<b>Valaitis Vytautas</b> , Marcinkevicius Virginijus, Learning Aerial Image Similarity using Triplet Networks
9.40—10.00	<b>De Luca Davide Luciano</b> , Petroselli Andrea, Galasso Luciano, Modelling climate changes with stationary models: is it possible or is it a paradox?
10.00—10.20	<b>Aksonov Vladyslav</b> , Applying Linear Optimization Methods to Problems with Internal Dependencies
10.20—10.40	<b>Sharma Meenarli</b> and Mahajan Ashutosh, Practical Enhancements for the LP/NLP Algorithm for Convex MINLPs

**June 20, Thursday morning (11.00): Room 1**

Title: Special session “High Performance Computing in Modelling and Simulation” (part 1)	
Chairman: <b>Spataro William</b>	
11.00—11.20	Cicirelli Franco, <b>Giordano Andrea</b> and Mastroianni Carlo, Improving Efficiency in Parallel Computing Leveraging Local Synchronization
11.20—11.40	<b>Folino Gianluigi</b> , Pisani Francesco Segio and Pontieri Luigi, A cybersecurity framework for classifying non stationary data streams exploiting genetic programming and ensemble learning
11.40—12.00	<b>De Rango Alessio</b> , Furnari Luca , Giordano Andrea, Senatore Alfonso , D'Ambrosio Donato, Straface Salvatore and Mendicino Giuseppe, Preliminary model of saturated flow using Cellular Automata
12.00—12.20	<b>Primavera Leonardo</b> and Florio Emilia, Parallel algorithms for multifractal analysis of river networks
12.20—12.40	<b>Utrera Gladys</b> , Gil Marisa and Martorell Xavier, A methodology approach to compare performance of parallel programming models on HPC applications
12.40—13.00	<b>D'Ambrosio Donato</b> , Arcuri Paola, D'Onghia Mario, Rongo Rocco, Spataro William, Giordano Andrea, Spataro Davide, De Rango Alessio and Alfonso Senatore, A General Formalism for Multidimensional Space-Time Discrete Structured Grid Modelling





The 3rd International Conference and Summer School

# Numerical Computations: Theory and Algorithms NUMTA 2019

TH Le Castella Village di Isola Capo Rizzuto, Crotone, Italy  
**June 15 - 21, 2019**

## June 20, Thursday morning (11.00): Room 2

Title: Differential equations and Applications	
Chairman: <b>Mazzia Francesca</b>	
11.00—11.20	<b>Aceto Lidia</b> , Novati Paolo, Rational Approximations of the Fractional Laplacian in Reaction-Diffusion Problems
11.20—11.40	<b>Volkov Yuriy</b> , Derevtsov Evgeny, Schuster Thomas, Integral and differential operators as the tools of integral geometry and tomography
11.40—12.00	<b>Teodoro Filomena</b> , A Numerical Approach of a Certain Type of Mixed Functional Differential Equations
12.00—12.20	<b>Koustousova Elena</b> , On Polyhedral Estimates of Reachable Sets of Discrete-Time Systems with Uncertain Matrices and Integral Bounds on Additive Terms
12.20—12.40	<b>Singh Abhishe</b> , Mehra Mani, Finite Difference Approximation for Space-Time Fractional Diffusion Wave Equations
12.40—13.00	<b>Korotchenko Anatoly</b> , Smoryakova Valentina, On a comparison of several numerical integration methods for ordinary systems of differential equations

## June 20, Thursday morning (11.00): Room 3

Title: Discrete Optimization and Applications	
Chairman: <b>Paulavičius Remigijus</b>	
11.00—11.20	<b>Uteshev Alexei</b> , Goncharova Marina, On Stationary Points of Distance Depending Potentials
11.20—11.40	<b>Palkar Prashant</b> , Sharma Meenarli, Mahajan Ashutosh, Parallel Algorithms for Convex Mixed-Integer Nonlinear Optimization
11.40—12.00	<b>Sharun Ivan</b> , Zykina Anna, Kaneva Olga, Developing clustering algorithm for descriptor entities in education sector
12.00—12.20	<b>Di Gregorio Salvatore</b> , Addition of Integers Embodied in Cellular Automata with Different Representations
12.20—12.40	<b>Cuomo Salvatore</b> , Giampaolo Fabio and Gerardo Severino, Exact and Approximate Analytical Solutions for Nonlinearly Colloid Facilitated Solute Transport
12.40—13.00	<b>Khachay Michael</b> , Neznakhina Katherine, Ogorodnikov Yuri, Constant-factor approximations for generalizations of the asymmetric Vehicle Routing and Traveling Salesman Problems





# The 3rd International Conference and Summer School Numerical Computations: Theory and Algorithms NUMTA 2019

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## June 20, Thursday afternoon (15.00): Room 1

Title: Special session "High Performance Computing in Modelling and Simulation" (part 2)	
Chairman: <b>Giordano Andrea</b>	
15.00--15.20	Giordano Andrea, De Rango Andrea, Rongo Rocco, D'Ambrosio Donato, <b>Spataro William</b> , A Dynamic Load Balancing technique for Parallel Execution of Structured Grid Models
15.20—15.40	Lupiano V., <b>Calidonna Claudia R.</b> , Avolio E., Larosa S., Cianflone G., Viscomi A., De Rosa R., Dominici R., Alberico I., Pelosi N., Lirer F., Di Gregorio Salvatore, Final Sediment Outcome from Meteorological Flood Events: a Multi-Modelling Approach
15.40—16.00	<b>Vinci Andrea</b> , Cesario Eugenio and Zhu Xiaotian, Hierarchical Clustering of Spatial Urban Data
16.00—16.20	<b>Cannataro Mario</b> and Giuseppe Agapito, A parallel software platform for pathway enrichment
16.20—16.40	<b>Sapentina Anna</b> , Performance comparison of a geophysical code on manycore processors and hybrid clusters
16.40—17.00	<b>Forestiero Agostino</b> and Papuzzo Giuseppe, Neural word embeddings approach for a distributed management system in healthcare

## June 20, Thursday afternoon (15.00): Room 2

Title: Infinity Computing	
Chairman: <b>Sergeyev Yaroslav</b>	
15.00—16.40	<b>Round Table on the developments in the Infinity Computing Methodology</b>

## June 20, Thursday afternoon (15.00): Room 3

Title: Applications	
Chairman: <b>Toropov Vassili</b>	
15.00--15.20	<b>Wongprachan Ratchaneewan</b> , Modelling population size using Horvitz-Thompson approach based on the Poisson Lindley distribution
15.20—15.40	<b>Edalat Golnaz</b> , Sadeghieh Ali, Caristi Giuseppe, Characterization of efficient solutions in nonsmooth multiobjective problems using generalized invexity
15.40—16.00	<b>Hammachukiattikul Porpattama</b> , Novel criteria for finite-time stability, dissipativity, and passivity analysis of discrete-time neural networks with time-varying delays
16.00—16.20	<b>Mehandiratta Vaibhav</b> , Mehra Mani, Leugering Gunter, Existence and uniqueness of time-fractional diffusion equation on a star graph
16.20—16.40	<b>Srisuksomwong Pawalee</b> , Pekkoh Jeeraporn, Artificial Neural Network Model to Prediction of Eutrophication and Microcystis aeruginosa Bloom in Maekuang Reservoir, Chiangmai, Thailand
16.40—17.00	<b>Iudin Dmitry</b> , Iudin Feodor, Sergeyev Yaroslav, Noise-induced kinetic transition in two-component environment





## Numerical Computations: Theory and Algorithms NUMTA2019



Le Castella di Isola Capo Rizzuto, Crotone, Italy  
June 15-21, 2019

## Excursion CROTONE and SANTA SEVERINA CASTLE

June 18, 2019

### PROGRAM

- 14:30 Departure from TH Le Castella Village by bus to SANTA SEVERINA
- 15:30 Arrival at SANTA SEVERINA and guided Visit of the Castle
- 17:00 Departure to CROTONE (km. 32)
- 17:30 Arrival at CROTONE and guided tour of the Archaeological National Museum and Pythagora's Museum
- 19:30 Departure to TH Le Castella Village

**Crotone** was one of the most important centres of Magna Grecia, place where Pitagora founded his famous school.

#### Archaeological National Museum of Crotone

The Archaeological National Museum of Crotone opened to the public in 1968 and is among the most important in Calabria. The building, designed by the architect Franco Minissi, is located near one of the ramparts of the city walls which date back to the XVth century. The Museum is a few steps from the Castle of Charles V, in the historic heart of the city.

In its most recent staging, inaugurated in 2000, the Museum offers an exhibition route laid out on two floors.

On the ground floor, the visitor is guided, according to chronological order, to the discovery of the main historical time periods of the ancient Greek city of Kroton. Starting from the relationship with the indigenous communities already present at the time of its foundation (second half of the VIII century B.C.), it proceeds through the history of its athletes, doctors and philosophers, up to late antiquity. There are also displays explaining the urban archaeology and a section devoted to the kits of the necropolis of the Carrara site.

The second floor offers an overview of settlements in the territory (Krimissa, Petelia, Makalla) which fall in geographical areas rich in mythical traditions and linked to fundamental cults of the Greek city-states (Sirens, Philoctetes, Apollo Alaios) and continues with the main sanctuaries of the city. The sanctuary of the Goddess Hera Lacinia, at Capo Colonna, enjoys particular prominence. Among its treasures are golden diadem (a crown worn by Hera) and a fascinating yet equally mysterious small nuragic boat made of bronze. Both are recognized for their unique beauty and unusual craftsmanship.

[https://www.beniculturali.it/mibac/opencms/MiBAC/sito-MiBAC/Luogo/MibacUnif/Luoghi-della-Cultura/visualizza\\_asset.html?id=151810&pagename=157031](https://www.beniculturali.it/mibac/opencms/MiBAC/sito-MiBAC/Luogo/MibacUnif/Luoghi-della-Cultura/visualizza_asset.html?id=151810&pagename=157031)

#### Pythagora's Museum

It is a melting pot of art, maths and science, where big artists and painters of the last century as Rotella and Ceccobelli, have their space next to young contemporary artists that reinterpret the figure of Pythagora.

Maths becomes a physical and concrete installation which interacts with the visitor allowing the learning of theorems and complex concepts through playful interaction accessible to everybody.

<http://www.museodipitagora.com/home>

**Santa Severina** is an ancient Medieval hamlet located in the Province of Crotone, halfway between the Ionian Sea and the Sila plateau. It is surrounded by a wonderful hilly landscape, and the Neto river crosses its territory for 10 kilometers.

#### Santa Severina Castle

Its construction dates back to the Normans (XI century) on a pre-existing fortifications from the Byzantine period. The Byzantine construction is known as oppidum and is attested by Erchemperto of Benevento verbatim as "oppidum beatae Severinae". After 1076, on its ruins, Robert Guiscard built a dungeon whose traces were detected during the restoration work. A direct historical evidence is detectable in the chronicle of Montecassino Amato while, always in the same context, an indirect proof is constituted by a chartula of 1130, published by the Trinchera, in which the military building is defined as "Rock" which, as is known, it is a term of Scandinavian origin. In the period following the construction of the castle, it is attested, in Santa Severina.

In the Swabian period, the castle of Santa Severina was called Johannes de Ladda. This news is detectable in a document published by Walter Holtzmann appeared in "Quellen und Forschungen aus Italienischen Archiven und Bibliotheken". Throughout the ages and passages from various ruling families, he has undergone various changes. It is assumed that the area where it was built the castle already occupied in the Greek period, as the supposition of some excavations conducted during the renovation. Of particular interest are the remains of a Byzantine church (with frescoed walls) and a necropolis of the same historical period.

Of interest excavation carried out, in 2008-2009, from the archaeological Superintendence in the so-called "outpost C" and in the "rabbit cave". Other archaeological research, in 2011, showed the housing or funerary use of numerous gorges of the cliff, now difficult to reach and at risk of landslide. In the castle there is the Archaeological Museum, where exhibits are displayed - owned by the state - from the territory or found during the excavations in the fortification. You can visit some archaeological sites (caves, cemeteries, Byzantine church, etc. Norman tower foundation) brought to light during the excavations conducted by the Superintendence for Archaeological Heritage of Calabria.

<http://www.comune.santaseverina.kr.it/index.php?action=index&p=234>  
<https://www.calabriadascoprire.it/castello-santa-severina-racconta-la-citta/>  
[https://it.wikipedia.org/wiki/Castello\\_di\\_Santa\\_Severina](https://it.wikipedia.org/wiki/Castello_di_Santa_Severina)

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The program may have a different order of the visits  
according to any logistical needs



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**We are at your disposal.  
Please do not hesitate to ask!**







★★★★  
**LE CASTELLA  
VILLAGE**

- 1 BASKETBALL AND VOLLEY FIELD
- 2 SOCCER FIELD
- 3 THEATRE **Group photo**
- 4 BOWLS
- 5 BEACH BAR
- 6 CENTRAL SWIMMING POOL
- 7 BOUTIQUE
- 8 RESTAURANT "THE TERRACE"
- 9 CENTRAL RESTAURANT
- 10 CENTRAL BAR
- 11 ANIMATION
- 12 RECEPTION
- 13 TV ROOM
- 14 BAR
- 15 OFFICES
- 16 DOCTOR
- 17 BABY FOOD ROOM
- 18 BIRBA WORLD AND RESTAURANT
- 19 CONFERENCE CENTER **NUMTA 2019**
- 20 CONFERENCE CENTER
- 21 CONFERENCE CENTER
- 22 TENNIS COURTS
- 23 SPA
- 24 WALK
- 25 BERVERLY SWIMMING POOLS
- P PARKING

**Group photo**

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