

# Program

## ASMDA2023 Conference and Demographics Workshop

*Applied Stochastic Models and Data Analysis International Conference*

*Heraklion, Crete, Greece, 6 - 9 June, 2023 Hybrid*

**Tuesday, 6.6.2023**

**TIME ZONE:** [EEST – Eastern European Summer Time](#)

**Venue: Hellenic Mediterranean University  
Building K45 (School of Health Sciences, Lecture rooms)**

**8:30 - 10:00  
Registration**

**10:00 - 10:20  
[Room 1](#)  
Opening**

**10:20-12:00  
Honorary Ceremony and Plenary Session  
[Room 1](#) (PS1)  
Chair: Christos Floros  
Speaker: Nikolaos Apergis,  
Department of Banking & Financial Management, University of Piraeus  
Title: Climate Change and Monetary Policy**

**12:00- 12:30 Coffee Break**

**12:30-14.00  
SCS1  
Special and Contributed Sessions**

**[Room 1](#)**

**[Room 2](#)**

**[Room 3](#)**

**SPECIAL SESSION: Stochastic modelling with applications to finance and maintenance  
Chairs: Ying Ni and Lu Jin**

**SPECIAL SESSION: First passage time problems, non-local dynamics for stochastic processes and applications  
Chairs: Enrica Pirozzi and Giuseppina Albano**

**Data Analysis**

**Abigail Berta-Marko Dimitrov-  
Achref Bachouch-Christian Ewald-  
Ying Ni**

**BSDE Method for Pricing Options under Heston-type Models**

**Nikolai N. Leonenko  
Sojourn Functionals for Spatiotemporal Gaussian Random Fields with Long-memory**

**Pilar Valderrama-Mariano  
J. Valderrama**

**Essay of a Multinomial Logistic Model for the Thematic Classification of a Dental Journal Based on the Degree of Adherence to Quality Guidelines**

<b>Kentaro Fujioka-Ying Ni-Lu Jin</b> Optimal Age-replacement Policy for Series Systems Considering Parameter Uncertainty	<b>Enrica Pirozzi</b> On a Fractional Stochastic Risk Model with a Random Initial Surplus and a Multi-Layer Strategy	<b>James Freeman-Jola Nika</b> SEM and the Analysis of Mexican Poverty Data
<b>Ryu Izuwaki-Lu Jin</b> Inspection and Replacement Policy with a Flexible Inspection Schedule under Delay Time Model	<b>Giacomo Ascione</b> On the Uniform Ergodicity of a Class of Semi-Markov Processes	<b>Tereza Frömmelová-Filip Hon-Jitka Langhamrová</b> The Influence of Socio-Economical Variables on Fertility in Selected European Countries
<b>Mara Kalicanin Dimitrov-Marko Dimitrov-Anatoliy Malyarenko-Ying Ni</b> Bermudan Option Pricing Using Almost-Exact Scheme under Heston-type Models	<b>Giuseppina Albano -A. Barrera-V. Giorno-P. Roman-Roman-F. Torres-Ruiz</b> A General Growth Equation, Its Generalizations and Related First Passage Time problems	<b>Stamatina Daskalaki-George Matalliotakis</b> Research on the Degree of Use of New Technologies by Households and their Members. E-Commerce and the Security and Protection of their Personal Data
<b>Sota Ikenoya-Lu Jin</b> Some Properties on Optimal Maintenance Policies for k-out-of-n:G Systems with Imperfect Repair		<b>Tomáš Fiala-Jitka Langhamrová-Jana Vrabcová</b> Equitable Normal Pension Age Adjusted to Fertility and Migration
<b>14:00-15:00 Lunch</b>		
<b>15:00-15:40</b> <a href="#">Room 1</a> (PS2) <b>Plenary Session</b> <b>Chair: Fabrizio Ruggeri</b> <b>Speaker: Sally McClean</b> <i>Ulster University, School of Computing, Northern Ireland, UK,</i> <b>Title: Applied Stochastic Models and Data Analysis for Monitoring Patients in Smart Homes</b>		
<b>15:40 -16:00 Coffee Break</b>		
<b>16:00-17:30</b> <b>SCS2</b> <b>Special and Contributed Sessions</b>		
<a href="#">Room 1</a>	<a href="#">Room 2</a>	<a href="#">Room 3</a>
<b>Invited Sessions</b> <b>30-40 minutes talks</b> <b>Chair: Sally McClean</b>	<b>SPECIAL SESSION: First passage time problems, non-local dynamics for stochastic processes and applications</b> <b>Chairs: Enrica Pirozzi and Giuseppina Albano</b>	<b>METRIC - MODELS</b>
<b>Sheldon Ross-Tianchi Zhao</b>	<b>Abel Azze-Bernardo D'Auria-Eduardo García-Portugués</b>	<b>Lazaros Kanellopoulos</b> <b>Stochastic Orders and Reliability Properties for</b>

<i>University of Southern California, U.S.</i> Finding a Population having the Better Distribution	Optimal Stopping of Gauss-Markov Bridges via Time-space Transformations	Compound Geometric Convolutions with Applications in Perturbed Risk Processes
<b>Jean-Marie Robine</b> <i>Institut National de la Santé et de la Recherche Médicale</i> Change Over Time in Human Longevity (summary of a study by Camarda and Robine, 2023)	<b>Alessandra Meoli</b> A Shock Model with Time Randomized via a Multivariate Subordinator	<b>Jesús E. García-V.A. González-López -J.I. Gomez Sanchez</b> A Metric based on the EDC Criterion
	<b>Serena Spina</b> First Passage Time Problems for a Random Walk on the L-lattice	<b>Liberato Camilleri</b> Prosocial Behaviour of Students in Maltese Schools: A Multilevel Model
		<b>Carlos A. Coelho</b> Multi-way MANOVA and General Linear Model Likelihood Ratio Tests for the High- dimensional Case
		<b>Istvan Fazekas-Attila Barta-Bettina Porvazsnyik</b> Limit Theorems for a Network Evolution Model describing N-interactions
<b>17:30-19:00</b> <b>SCS3</b> <b>Special and Contributed Sessions</b>		
<a href="#"><u>Room 1</u></a>	<a href="#"><u>Room 2</u></a>	<a href="#"><u>Room 3</u></a>
<b>MARKOV</b>	<b>Models and Modeling I</b>	<b>Economy</b>
<b>Philippe Carette-Marie-Anne Guerry</b> A Conditional Embedding Problem for Finite Homogeneous Markov Chains	<b>Andreas Groll-Trevor Hastie-Thomas Kneib-Gerhard Tutz</b> Effects Selection via Likelihood-based Boosting in Cox Frailty Models	<b>Emmanuel Apergis-Andreas Markoulakis</b> High Performance Computing in the Digital Economy
<b>Roberto Casarin-Antonio Peruzzi-Mark Steel</b> Media Bias and Polarization through the Lens of a Markov Switching Latent Space Model	<b>Samir K. Safi-Olajide Idris Sanusi</b> Comparative Analysis of Hybrid MIDAS-SARIMA Models for GDP Forecasting: Empirical Evidence from Palestine	<b>Dominique Desbois</b> Applying Entropy Criterion to Input Allocation: Fertilizer Cost Estimates for European Countries
<b>Brecht Verbeken-Marie-Anne Guerry</b> Maintainability and Attainability for Discrete-time Homogeneous Semi-Markov models	<b>Huma Shabir-Ali Raza</b> Analysis of Stochastic Anthrax Epidemic Model	<b>Dimitrios Konstantios-Maria Grydaki</b>

		Does Annual Report Readability Affect Investment Efficiency?
<b>Viacheslav Vavilov</b> Probabilistic Characteristics of a Two-channel Retrial Queue Operating in a Semi-Markov Environment	<b>Aida Toma-Amor Keziou-Luiza Bădin-Silvia Dedu</b> Robust Pitman Type Estimators for Moment Condition Models	<b>Klaudia Przybysz- Agnieszka Stanimir</b> Silver Economy in the Age of Seniors' Activity
<b>Hidekazu Yoshioka-Yumi Yoshioka</b> The Expectation of a Mixed Moving Average Process Subject to Ambiguous Lévy Basis	<b>Gianluca Ursino-Monique Borg Inguanez-David Suda-Joseph Borg-Graziella Zahra</b> Bayesian Birth-Death Skyline Model - A Case Study on Heterochronous Maltese SARS- CoV-2 Genomic Data	<b>Alexandros Apostolakis- Christos Floros-Evanthia Zervoudi-Dimitrios Vortelinos</b> Hotel Sales during COVID- 19: Evidence from the US
<b>End of the 1<sup>st</sup> Day</b>		

# Program

## ASMDA2023 Conference and Demographics Workshop

*Applied Stochastic Models and Data Analysis International Conference*

*Heraklion, Crete, Greece, 6 – 9 June, 2023 Hybrid*

**Wednesday, 7.6.2023**

**TIME ZONE:** [EEST – Eastern European Summer Time](#)

**Venue: Hellenic Mediterranean University  
Building K45 (School of Health Sciences, Lecture rooms)**

**8:30 – 9:00  
Registration**

**09:00-10:30**

**SCS4**

**Special and Contributed Sessions**

<a href="#">Room 1</a>	<a href="#">Room 2</a>	<a href="#">Room 3</a>
<b>Economy II</b>	<b>Distributions I</b>	<b>HEALTH I</b>
<b>Karl Lewis-Mark Anthony Caruana-David Paul Suda</b> Optimising Financial Trading Strategies using Dynamic Bayesian Networks	<b>Alice Giampino-Roberto Ascari-Sonia Migliorati</b> A Flexible Generalization of the Latent Dirichlet Distribution	<b>Chia Ngee Choon-Lim Kia Yee</b> Health State Function and Red Herring Hypothesis
<b>Jean-Paul Murara</b> The Mean-Variance Problem Considering Investor's Views: Black-Litterman model on a Swedish Portfolio	<b>Nika Ivanova</b> On Asymptotical Insensitivity of Reliability Function of a k-out-of-n System to the Shape of Its Repair Time Distribution	<b>Fotini Diamanti-Christina Parpoula</b> Psychological Distress Surveillance Using Google Trends: Data Storytelling for the "New" Mental Health Pandemic
<b>Cátia Rosário-Ana Lorga da Silva</b> Business Density and Economic Growth in Portugal	<b>Meglana Lazarova-Leda Minkova-Michail Todorov</b> On the Bivariate Polya-Aeppli Counting Process and its Applications	<b>Troka Gersilda-George Matalliotakis</b> The Financial Ramifications of the Pandemic of COVID -19 on primary Healthcare Sectors of the 7th health Region of Crete and the Management for the Treatment
<b>Evangelos G. Varouchas-Stavros E. Arvanitis-George M. Agiomirgianakis-Christos Floros</b> Board Ethnic Diversity and ESG Performance: Empirical Evidence from US Banks	<b>Maira Ledaki-Myrto Papageorgiou</b> Simple form of Probability Density Functions via Sampling	<b>Nikolaos Grigorakis-Georgios Galyfianakis</b> How Vulnerable Public Health Financing is to Military Expenditure Fluctuations: Evidence from NATO Members in the Foreground of a New Cold War Era
<b>Yifeng Guo-Jin-hong Du-Xueqin Wang</b> High Dimensional Portfolio Selection with Cardinality Constraints		<b>Qi Guo-Aurea Grané-Giancarlo Manzi</b> Twitter Sentiment Analysis: Exploring Users' Perceptions on Health and Well-Being in Europe

<p>10:30-11:10  <a href="#">Room 1</a> (PS3)  Plenary Session  Chair: Fabrizio Ruggeri  Speaker: Dmitrii Silvestrov,  Department of Mathematics, Stockholm University, Stockholm, Sweden  Title: Perturbed Semi-Markov Type Processes and Applications</p>		
<p>11:10- 11:30 Coffee Break</p>		
<p>11:30-12:10  <a href="#">Room 1</a> (PS4)  Plenary Session  Chair: Fabrizio Ruggeri  Speaker: Ying Ni,  Associate Professor in Mathematics/ Applied mathematics,  Mälardalen University, Sweden  Title: Option Pricing and Hedging using Artificial Intelligence (AI) Technology</p>		
<p>12:10-14:00  SCS5  Special and Contributed Sessions</p>		
<a href="#">Room 1</a>	<a href="#">Room 2</a>	<a href="#">Room 3</a>
<p><b>Special Session: Stochastic Models in Economy and Finance</b>  Chair: <b>Filippo Petroni</b>  Università Politecnica delle Marche, Ancona, Italy</p>	<p>Sociology</p>	
<p><b>Shakti Singh-Guglielmo D'Amico-Dharmaraja Selvamuthu</b>  Optimal Investment-disinvestment Choices in Health-dependent Variable Annuity</p>	<p><b>Anastasia Charalampi-Catherine Michalopoulou-Clive Richardson</b> Exploring Measurement Invariance: Political Trust in National Institutions across Social Groups</p>	
<p><b>Guglielmo D'Amico-Bice Di Basilio-Filippo Petroni</b>  Drawdown-Based Measures for Financial Volumes via Semi-Markov Model</p>	<p><b>V.G. Semyonova-A.E Ivanova-.P. Sabgaida-A.V. Zubko-G.N. Evdokushkina</b>  Social Consequences of the COVID-19 Pandemic in Moscow and St. Petersburg: Similarities and Differences</p>	
<p><b>Mohammad Sarfraz-Guglielmo D'Amico-Dharmaraja Selvamuthu</b> Efficient Calibration of a Markov Regime Switching Model: An Application to Variable Annuity Pricing</p>	<p><b>Glykeria Stamatopoulou-Maria Symeonaki</b>  Intergenerational social mobility in Europe: Findings from the European Social Survey</p>	
<p><b>Guglielmo D'Amico-Riccardo De Blasis</b>  Dividend Based Stock Risk Measures: A Markov Chain Approach</p>	<p><b>Aggeliki Kazani-Eva Tsouparopoulou-Dimitris Parsanoglou-Maria Symeonaki</b>  Factors Explaining Perceptions towards Information and</p>	

	Communication Technologies (ICT) with Data Drawn from the ESS	
<b>Giovanni Masala-Filippo Petroni</b> Drawdown Risk Measures for Asset Portfolios with High-Frequency Data	<b>Georgios Pozios-Menita Masoura-Sonia Malefaki</b> Studying the European Union Innovation Index and its Affecting Factors	
<b>Guglielmo D'Amico-Riccardo De Blasis-Veronica Vigna</b> The Cost of Advertising: Real Option Estimation through Markov Chains		
<b>Riccardo De Blasis-Graziella Pacelli-Salvatore Vergine</b> Energy-Sharing Policy: Influence of Demand		
<b>14:00-15:00 LUNCH</b>		
<b>15:00 - 21:00</b> <b>Guided tour to Knossos and the Heraklion Archeological Museum ending with a Greek "Meze" in a local Taverna</b>		
<b>End of the 2<sup>nd</sup> Day</b>		



# Program

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**Thursday, 8.6.2023**

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**Venue:** Hellenic Mediterranean University

**Building K45 (School of Health Sciences, Lecture rooms)**

**8:30 - 9:00**  
Registration

**9:00-10:30**  
SCS6

**Special and Contributed Sessions**

<a href="#">Room 1</a>	<a href="#">Room 2</a>	<a href="#">Room 3</a>
<b>Stochastic II</b>	<b>Stochastic I</b>	<b>Models and Modeling II</b>
<p><b>Azam Imomov-Zuhriddin A. Nazarov</b> Some Limit Theorems for the Total Progeny of a Positive Recurrent Q-processes</p>	<p><b>Barbara Pacchiarotti</b> Small Time LDP and Stochastic Volatility Models</p>	<p><b>Aggeliki Yfanti-Catherine Michalopoulou</b> Modeling Religion Variables on Self-perceived Social Class: Evidence from the 7th Wave of the World Values Survey, 2017-2020</p>
<p><b>Yury Khokhlov-Oksana Sidorova-Lev Suslov</b> Asymptotic Upper Bounds for Overflow Probability in the Case of Heterogeneous Traffic</p>	<p><b>Ali Raza-Chanda Shahzadi-Rashid Javed</b> Non-standard Computational Analysis of the Stochastic COVID-19 Pandemic Model: An Application of Computational Biology</p>	<p><b>Timothy M. Young-Ampalavanar Nanthakumar</b> On the Use of Copula for Quality Control based on an AR(2) Model</p>
<p><b>Andrei Zaitsev</b> Improved Applications of Arak's Inequalities to the Littlewood-Offord Problem</p>	<p><b>Chanda Shahzadi-Ihtasham</b> Dynamical Analysis of Discrete Stochastic SIR Model</p>	<p><b>Flavius Guias</b> The Influence of the Asymptomatic Transmission on the Number Symptomatic Cases within a Modified SIR model</p>
<p><b>Julio Rodriguez</b> Network of Adaptive Frequency Oscillators in a Ballistic (i.e., non-Gaussian) Noisy Environment</p>		<p><b>Cédric Noel-Jang Schiltz</b> Multiple Trajectory Analysis in Finite Mixture Models</p>
<p><b>Aynura Poladova-Salih Tekin-Zulfiye Hanalioglu</b></p>		<p><b>Mario Abundo</b></p>



Investigation of Renewal-Reward Process with Dependent Components		On the First-Passage Area of a One-Dimensional Diffusion Process with Stochastic Resetting
<b>10:30-11:10</b> <b><a href="#">Room 1</a> (PS5)</b> <b>Plenary Session</b> <b>Chair: Gilbert Saporta</b> <b>Speaker: Claude Lefèvre,</b> <b>Université Libre de Bruxelles, Département de Mathématique, Bruxelles</b> <b>Title: On Partially Schur-constant Models and their Associated Copula</b>		
<b>11:10-11:50</b> <b><a href="#">Room 1</a> (PS6)</b> <b>Plenary Session</b> <b>Chair: Claude Lefèvre</b> <b>Speaker: Gilbert Saporta</b> <b>Title: Optimal Scaling: New Insights into an Old Problem</b>		
<b>11:50- 12:20 Coffee Break</b>		
<b>12:20-14:00</b> <b>SCS7</b> <b>Special and Contributed Sessions</b>		
<b><a href="#">Room 1</a></b>	<b><a href="#">Room 2</a></b>	<b><a href="#">Room 3</a></b>
<b>Special Session I</b> <b>Risk Analysis based on stochastic models or AI</b> <b>Chairs: Mei-Ling Tin Lee and Catherine Huber</b>	<b>Distributions - Data Analysis</b>	<b>Time Series - Survival</b>
<b>Catherine Huber</b> From Prediction to Interpretation: Neural Networks vs Classical Statistics. Application to Dementia Prediction	<b>Maria-Sofia Sotiropoulou-Stuart Cornwell</b> Distribution of Gender Correspondence and Phonological Similarity between French, Greek, and Spanish Nouns	<b>Mahdia Azzal-Megdouda Ourbih-Tari</b> The Use of the Refined Descriptive Sampling to Reduce the Estimation Variance of the Survival Function
<b>Francesca Pierri-Chrys Caroni</b> The Cox Model and Beyond in the Prediction of Business Failures	<b>Markos V. Koutras-Spiros D. Dafnis</b> A New Family of Continuous Univariate Distributions with Applications in Actuarial Science	<b>Jerzy Filus-Lidia Filus</b> The Joiner Representation of Multivariate Survival Functions. The r-Dependence Analysis
<b>Yiming Chen-Paul Smith-Mei-Ling Ting Lee</b> Neural Network for First-hitting-time Based Threshold Regression Model	<b>Ayana Mateus-Frederico Caeiro</b> Probability weighted Moment Method: An Approach to Estimating the Pareto Distribution	<b>Vurukonda Sathish-Debraj Chakraborty-Siuli Mukhopadhyay</b> Graphical Estimation of Multivariate Count Time Series
<b>A. Karagrigoriou-I. Mavrogiannis-G. Papisotiriou-I. Vonta</b>	<b>Sara Bendjeddou</b> Non-Parametric Estimation for Time Varying Integer Valued Processes	<b>Valeriy Voloshko-Yuriy Kharin</b> Data Analysis of Discrete-Valued Time Series Based on Exponential Family

An Exponentiality Test against Heavy & Light Tailed Alternatives		
<b>P. Pefanis-A. Karagrigoriou-A. Effraimis-V. Georgiou</b> Statistically Explainable Artificial Intelligence: Influential Features & Leverage Instances	<b>Paraskevas-Marios Chavatzopoulos-Pavlos Karamitros-Ioannis Theotokas</b> A Methodology for Evaluating Human Resources in the Maritime Industry Using Analytics	<b>Norio Watanabe</b> A Generalization of the k-means Method for Trends of Time Series
		<b>Tai Young-Taft</b> Nonlinear Dynamics of US Inflation, Money Supply, and Growth Time Series
<b>14:00-15:00 Lunch</b>		
<b>15:00-15:40</b> <a href="#">Room 1</a> (PS7) <b>Plenary Session</b> <b>Chair: Gilbert Saporta</b> <b>Speaker: Fabrizio Ruggeri</b> <b>CNR IMATI, ITALY</b> <b>Title: Unsupervised Statistical Tools for Anomaly Detection: The Case of Healthcare Frauds</b>		
<b>15:40-16:00 Coffee Break</b>		
<b>16:00-17:30</b> <b>SCS8</b> <b>Special and Contributed Sessions</b>		
<a href="#">Room 1</a>	<a href="#">Room 2</a>	<a href="#">Room 3</a>
<b>Stochastic III</b>	<b>Health II</b>	<b>Cluster Analysis</b>
<b>Maria Tantoula-Konstantinos Gkillas-Dimitrios Vortelinos-Christos Floros</b> Modeling and Forecasting Stochastic Volatility of Cryptocurrencies	<b>Spyridon A. Kontos-George S. Atsalakis</b> Regional Mortality and Health Status in Greece (1990-2020)	<b>Seda Kilicer-Ruya Samli</b> Determination of Moods in Turkish Sentences with Sentiment Analysis Method
<b>Javier Villarroel-Juan A. Vega</b> The Distribution of the Amount of Rain. A Renewall Stochastic Process Model	<b>Christos H. Skiadas-Yiannis Dimotikalis</b> Expanding the Life Tables to Include the Healthy Life Expectancy. The Case of Norway	<b>Elena Babatsouli</b> Mixedupness of children's productions of consonant clusters and how to measure it
<b>Bilal Barakeh</b> On the Arbitrage in Models Based On Fractional Brownian Motion	<b>Kornélia Svačinová-Elena Říhová</b> Analysis of Health Status in the Czech Republic: 2019-2022 Trends	<b>Rafik Abdesselam</b> A Topological Clustering on Evolutionary Data
<b>Stergios B. Fotopoulos-Alexandros Paparas</b>	<b>Ilias Velaoras-George Matalliotakis</b>	<b>Per Arnqvist-Sara Sjöstedt de Luna-Natalya Pya Arnqvist</b>

The Distribution of the Maximum Likelihood Estimates of the Change Point and their Relation to Random Walks	Primary Health Care during the Period of Covid - 19 pandemic. The Effect of the Pandemic on the Cost and the Quality of Services rendered at Health Care Centers of Fthiotida Prefecture	fdaMocca: An R Package for Model-based Clustering for Functional Data with Covariates
<b>Rita Giuliano-Claudio Macci-Barbara Pacchiarotti</b> Asymptotic Results for Sums and Extremes	<b>Jana Vrabcová-Markéta Majerová-Tomáš Fiala-Jitka Langhamrová</b> Which Socio-demographic Indicators Influence the Health Rating? Example of EHIS on Czech data	<b>Gloria Gheno</b> New Bicluster Algorithm for Trading
<b>17:30-19:00</b> <b>SCS9</b> <b>Special and Contributed Sessions</b>		
<b><u>Room 1</u></b>	<b><u>Room 2</u></b>	<b><u>Room 3</u></b>
<b>Economy III</b>	<b>Health III</b>	<b>Cluster - Algorithms</b>
<b>Oumar Mbodji-Traian A Pirvu</b> Portfolio Time Consistency and Utility Weighted Discount Rates	<b>Konstantinos N. Zafeiris-Christos H. Skiadas</b> Comparing Healthy Life Expectancy in Uganda and Kenya	<b>Oswaldo Silva-Áurea Sousa-Helena Bacelar-Nicolau</b> Comparison and Evaluation of Partitions in Hierarchical Cluster Validation
<b>Dimitrios Petrakis-George Matalliotakis</b> The Impact of the COVID-19 Pandemic on the Financing and Financial Management of Public Hospitals in Greece	<b>Konstantinos N. Zafeiris-Byron Kotzamanis-Christos H. Skiadas</b> Mortality and Health Developments in Bosnia-Herzegovina and Montenegro	<b>Giovanna Apicella-Emilia Di Lorenzo-Giulia Magni-Marilena Sibillo</b> Longevity Comparison by Gender: Exploring the Future through an Evidence-based Approach
<b>Luca Salvati</b> Assessing Path-dependence in Socioeconomic Processes: The Contribution of Spatial Econometrics and Exploratory Multivariate Analysis	<b>Alejandro Aguirre -Eliud Silva</b> The Crossovers between Births and Deaths caused by COVID-19: The Mexican case	<b>Giovanna Apicella-Emilia Lorenzo-Gabriella Piscopo-Marilena Sibillo</b> The Functional Clustering of the Mortality Gender Gap: A Multi- country Analysis
<b>Konstantinos Vasilakakis-Efthalia Tabouratzi-Despoina Sdrali</b> The Importance of the Initial Selection of Suppliers in the Food Service Divisions of Hotels, the Current Situation in the Supply Chain of Greece	<b>Vladimir Anisimov-Matthew Austin</b> Advances in Forecasting and Optimally Designing Patient Enrolment in Multicentre Clinical Trials under Various Restrictions	<b>Rosa M. Fernández-Alcalá-José D. Jiménez-López-Jesús Navarro-Moreno-Juan C. Ruiz Molina</b> An Efficient Distributed Fusion Smoothing Algorithm for T-proper Hypercomplex Multisensor Systems with Uncertain Observations
<b>Yiannis Yiannoulis and Dimitrios I. Vortelinos</b> Beneish M-Score and Altman Z-Score in Athens Exchange	<b>Giovanna Apicella-Eliseo Navarro-Pilar Requena-Marilena Sibillo</b> An International Comparison of the Impact of Covid-19 on Mortality Rates using Graduation Techniques	<b>Áurea Sousa-Oswaldo Silva-Helena Bacelar-Nicolau</b> Comparison Between two Algorithms for Computing the Weighted Generalized Affinity Coefficient in the Case of Interval Data

<p><b>Konstantina Ragazou- Konstantinos Spinthiropoulos- Alexandros Garefalakis- Christos Papademetriou-George Sklavos</b></p> <p>The Moderating Impact of Human Resource on ESG Performance of Financial Companies in Europe</p>		<p><b>Ayşe Berika Varol Malkoçoğlu- Ruya Samli</b></p> <p>Comparative Performance Analysis of YOLOv4 and YOLOv5 Algorithms on Dangers Objects</p>
<p>20:00 - 24:00 <b>Farewell Dinner</b> <b>Cretan food, music and dances</b></p>		
<p>End of the 3<sup>rd</sup> Day</p>		

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**8:30 - 9:00**

**Registration**

**09:00-10:30**

**SCS10**

**Special and Contributed Sessions**

<a href="#">Room 1</a>	<a href="#">Room 2</a>	<a href="#">Room 3</a>
<b>STATISTICS I</b>	<b>Special Session I Identifying Change Points in Data Streams with Applications</b>	<b>Stochastic Theory and Applications</b>
<b>Elena Almaraz Luengo</b> Critical Analysis of ENT Statistical Battery	<b>Chairs: Sotiris Bersimis and Polychronis Economou</b>	<b>Andrey Bulinski</b> Quantifying Non-Markovianity of Evolution Processes in Open Quantum Systems
<b>Marek Brabec</b> Semiparametric Statistical Calibration of the Numerical Air Pollution Model Outputs	<b>S. Bersimis-F. Bersimis-S. Chakraborti-P. Economou</b> A Non-Parametric Monitoring Procedure for Monitoring Multivariate Processes Based on Convex Hulls	<b>Ekaterina Bulinskaya</b> Stochastic Insurance Models with Investment and Reinsurance
<b>Jana Kalická-Dominika Sónak Ballová</b> Statistical Analysis of Groundwater Level Regime in Slovakia	<b>Grigoris Papageorgiou- Polychronis Economou-Sotiris Bersimis</b> Discover Hidden Trends and Patterns using Text Visualization	<b>Ekaterina Vl. Bulinskaya</b> Spread of Branching Random Walk with Periodic Branching Sources
<b>Karla Tayumi Ishy-Ana Lorga da Silva</b> Portuguese Prison Statistics from a Gender Perspective	<b>Ekaterini Skamnia-Polychronis Economou-Sotiris Bersimis</b> Detect Outliers, Break Points and Level Shifts: An Application in Shipping Industry	<b>Alexander Bulinski</b> Some Generalizations and Applications of Rényi's Theorem
<b>Panagiotis Andreopoulos- Fragkiskos G. Bersimis- Kleomenis Kalogeropoulos- Alexandra Tragaki-Katerina Synani-Konstantinos Abeliotis</b> Food Waste Comparative Statistical Analysis	<b>Kyriakos Skarlatos-Petros E. Maravelakis-Sotiris Bersimis</b>  Detecting change points in multivariate data streams. A use case in shipping	<b>Elena Yarovaya</b>  Limit Theorems for Continuous-Time Branching Random Walks

		<b>Yana Belopolskaya-Andrey Chubatov</b> Stochastic Processes Associated with Fully Nonlinear Parabolic Equations in Financial Mathematics
<b>10:30 - 11:00 Coffee Break</b>		
<b>11:00-12:30 SCS11 Special and Contributed Sessions</b>		
<b><u>Room 1</u></b>	<b><u>Room 2</u></b>	<b><u>Room 3</u></b>
<b>Gender Inequalities in Educational Contexts</b>  Special Session Organized by <b>Adele H. Marshall and Mariangela Zenga</b>	<b>Special Session II Techniques &amp; Applications of Advanced Analytics &amp; Machine Learning in Health &amp; Insurance</b>	<b>HEALTH IV</b>
<b>Aglaia Kalamatianou and Fotios S. Milienos</b> Modelling the share of women in university education	<b>Chairs: Sotiris Bersimis and Polychronis Economou</b>	<b>Marianna Gekou-George Matalliotakis</b> Assessment of Nutritional Status and Quality of Life in Cancer Patients
<b>Michele La Rocca, Marcella Niglio, and Marialuisa Restaino</b> An analysis of gender gap in students' performance: preconception or reality?	<b>Vasileios Georgakis-Panos Xenos</b> Healthcare Risk Management: Machine Learning in Myocardial Infarction	<b>Ho Kim-Taerim Lee</b> Prognosis of COVID-19 Patients by the Underlying Diseases and Drug Treatment
<b>Adele H. Marshall and Mariangela Zenga</b> Gender and ICT inequalities among adolescents: a comparative analysis in PISA	<b>Antonios Karaminas, Polychronis Economou, Sotiris Bersimis</b> Predicting Non-Shows and Optimizing Services in Primary Healthcare	<b>Susanna Levantesi-Andrea Nigri-Damiano Ticconi</b> An Alternative Approach to Causes of Death Prediction using Support Vector Machines
<b>Franca Crippa, and Mariangela Zenga</b> Almost Graduate, close to employment? A glimpse of the companies recruiting at a university job placement office	<b>Christos Spyropoulos, Polychronis Economou, and Sotiris Bersimis</b> The Value of Data Exploitation in Sports Industry: An Overview	<b>Tamara Sabgayda-Alexander Zubko-Victoria Semyonova</b> Impact of COVID-19 Pandemic on Mortality of Elderly in Gender Aspect
	<b>Zoi Bartsioka, A. Charalabidis, P.E. Maravelakis and S. Bersimis</b> Runs and scans rules for optimizing educational processes	<b>Hong Mi-Yixiao Wei</b> From Zero Clearing to Opening Management: The Estimation of the Confirm Cases and Mortality Cases In Post-Covid-19 Pandemic Governance (Nov.2022-Feb.2023)
	<b>G. Arvanitopoulos-P. Economou-S. Bersimis</b>	

	Applications of Text Mining and Natural Language Processing in Health	
<b>12:30-14:00</b> <b>SCS12</b> <b>Special and Contributed Sessions</b>		
<a href="#"><u>Room 1</u></a>	<a href="#"><u>Room 2</u></a>	<a href="#"><u>Room 3</u></a>
<b>Regression</b>	<b>Data Analysis - Demography</b>	<b>RISK I</b>
<b>Manlio Migliorati-Anna Simonetto</b> Using Surrogate Models and Variable Importance to better Understand Random Forests Regression Fitting	<b>Jesús E. García-V.A. González-López-M.M. Kcala Álvaro</b> Independence Test for Continuous Random Variables based on the Shape of the Young Tableau	<b>Basak Gever-Tahir Khanliyev</b> Approximate Formula for Adjustment Coefficient of a Non-linear Risk Model
<b>Yuefeng Si-Yingying Zhang-Guodong Li</b> An Efficient Tensor Regression for High-dimensional Data	<b>Margarida Xavier-Paula Chainho-Ana Lorga da Silva</b> Compliance with IUU Fisheries of Manila Clam in Tagus Estuary	<b>Fanni K. Nedényi</b> Probability equivalent level of Value at Risk and higher-order Expected Shortfalls
<b>David Suda-Monique Borg Inguanez-Lara Cilia</b> Penalised Regression Adaptations of the Longstaff-Schwartz Algorithm for Pricing American Options	<b>Juliana Barbosa Medeiros-Neir Antunes Paes</b> Updating the Proposal for Assessing the Quality of Census Count of Centenaries	<b>Giuliana Passamani-Paola Masotti</b> Assessing Pollution Risk Using Asymmetric GARCH Models and Dynamic Correlation
<b>Timon Gaertner-Serguei Kaniovski-Yuri Kaniovski</b> Constrained Maximum Likelihood Estimation of Conditional Migration Probabilities and Regimes-switching Matrices	<b>Barun Kumar Mukhopadhyay</b> "Non-Heaping" in Age Data: A New Technique	<b>Georgios C. Zachos</b> A Note on the Convergence of Euler Contributions, Depending on the Underlying Risk Measure
<b>Konstadinos Politis</b> Some Relations between the Renewal and the Harmonic Renewal Function	<b>Yiannis Bakirlis &amp; Yiannis Dimotikalis</b> Analytics of Restaurant Ratings in Crete Island by Greek and Foreigner Users of TripAdvisor	<b>Silvia Dedu, Vasile Preda, and Muhammad Sheraz</b> General information measures for loss models and survival models involving truncated and censored random variables
<b>14:00- 15:00 LUNCH</b>		
<b>15:00-15:30</b> <b><a href="#"><u>Room 1</u></a> (PS8)</b> <b>Plenary Session</b> <b>Chair: Fabrizio Ruggeri</b> <b>Speaker: Peter Pflaumer</b> <b>Department of Statistics, Technical University of Dortmund, Germany</b> <b>Title: Leonhard Euler's Study on the Reproduction of the Human Race</b>		

<p>15:30-16:00  <a href="#">Room 1</a> (PS9)  <b>Plenary Session</b>  <b>Chair: Fabrizio Ruggeri</b>  <b>Speaker: Lars Fadnes</b>          Department of Global Public Health and Primary Care &amp; Bergen Addiction Research</p> <p>Comparison of Life Expectancy Gains from Various Dietary Changes: Modelling in Seven Countries under the Food4HealthyLife Framework</p>		
<p>16:00- 16:30 Coffee Break</p>		
<p>16:30-17:30  <b>SCS13</b>  <b>Special and Contributed Sessions</b></p>		
<a href="#">Room 1</a>	<a href="#">Room 2</a>	<a href="#">Room 3</a>
<b>RISK II</b>	<b>Simulation</b>	<b>Statistics II</b>
<p><b>Eleni Serafetinidou-Christina Parpoula</b>          Assessing Depression Risk using Subjective and Objective Health Indicators: A Cox Regression Analysis</p>	<p><b>Siham Bey-Zohra Guessoum-Abdelkader Tatachak</b>          Simulation of a Non-Parametric Regression Estimator with Dependent and Incomplete Data</p>	<p><b>Leopold Tobias</b>          Effects of Uncertain Input Data on Sample Size and Test Duration in Reliability Demonstration Tests</p>
<p><b>Maria Carannante-Valeria D'Amato</b> Modelling ESG greenwashing reputational risks in the insurance market</p>	<p><b>Dora Prata Gomes-M. Manuela Neves</b>          Extreme Value Parameters' Estimation: An overview of Simulation Procedures</p>	<p><b>Spiros D. Dafnis-Theodoros Perdikis-Markos V. Koutras</b>          Improved Shewhart-type Control Charts based on Weak Runs in Multistate Trials</p>
<p><b>Nektarios Gavrilakis-Christos Floros</b>          Sustainable Finance, Herding Behavior, and Risk Aversion under Uncertainty</p>	<p><b>Francisco Plaza-Eleuterio Yáñez-Pierre Freón-Héctor Araya-Antonio Aranís</b>          Deep Learning and Surplus Production Models for Multivariate Autoregressive Modelling and Simulation of the Jack Mackerel Fishery Associated with Environmental Conditions</p>	<p><b>Maria Tsifoutidou and Nikolaos Farmakis</b>          Continuous Increasing Probability Density Functions: An Approach through Sampling</p>
<p>17:30-18:10  <b>Plenary Session</b>  <a href="#">Room 1</a> (PS10)  <b>Chair: Gilbert Saporta</b>  <b>Speaker: N. Balakrishnan</b>  <i>Distinguished University Professor, Department of Mathematics and Statistics          McMaster University, Hamilton, Ontario, Canada</i>  <b>Title: Accelerated Life Testing of One-Shot Devices: Data Collection and Analysis</b></p>		
<p>18:10-18:30  <a href="#">Room 1</a>  <b>Closing Ceremony</b></p>		
<p><b>End of the Conference</b></p>		



## **Meeting information**

### **Link for Opening Ceremony, Closing Ceremony, Plenary Sessions and Room 1**

Meeting link: <https://isast.webex.com/isast/j.php?MTID=m52a476cb2af1fc8f6e42218dcd99151d>

Meeting number: 2740 092 5121

Password: asmda2023

Host key: 969912

Join by video system: Dial 27400925121@isast.webex.com. You can also dial 62.109.219.4 and enter your meeting number.

Join by phone: +44-20-7660-8149 United Kingdom Toll, Access code: 2740 092 5121, Host PIN: 6032

### **Link for Room 2**

Meeting link: <https://isast.webex.com/isast/j.php?MTID=ma60dd2b654817da69aed1f3cb64462ee>

Meeting number: 2743 780 4462

Password: asmda2023

Host key: 874016

Join by video system: Dial 27437804462@isast.webex.com. You can also dial 62.109.219.4 and enter your meeting number.

Join by phone: +44-20-7660-8149 United Kingdom Toll, Access code: 2743 780 4462, Host PIN: 6032

### **Link for Room 3**

Meeting link: <https://isast.webex.com/isast/j.php?MTID=m7b2f2c36303eb88369e167396c041d89>

Meeting number: 2742 660 8800

Password: asmda2023

Host key: 110886

Join by video system: Dial 27426608800@isast.webex.com. You can also dial 62.109.219.4 and enter your meeting number.

Join by phone: +44-20-7660-8149 United Kingdom Toll, Access code: 2742 660 8800, Host PIN: 6032

## **Social Events**

### **Half Day Excursion**

When: Wednesday, 7 June 2023

Departure time: 15:00 pm

Meeting point: Conference venue

Route: Guided tour to Knossos archaeological site, Archaeological Museum of Heraklion, light dinner

### **Conference Dinner**

When: Thursday, 8 June 2023

Departure time: 20:00

Duration 20:00- 24:00

Meeting point and drop off: In front of the Archaeological Museum of Heraklion, Eleftheria sq.

Venue: Kalikakis estate, Episkopi Village, Heraklion

### **Menu**

#### *Starters*

Cretan cream cheese

Traditional vegetable pie

Cretan spinach pie

Potatoes baked with cheese

Penne with mushrooms

#### *Cretan salad*

#### *Main course*

1<sup>st</sup> Boiled beef and traditional rice (pilafi)

2<sup>nd</sup> Baked lamb (ofto) with potatoes

Alternatively, Vegetarian meal to be arranged.

#### *Desert*

Local cheese pies with honey.

*Cretan wine, refreshments, water*

*Cretan music and dancers will accompany the event.*

## Practical Information

### Basics

Time (GMT) +2 hours

Power 220v 50AC

Emergencies call 100

Top speed 100-120 km/h

### Getting there

#### *By Air.*

The airport of Heraklion is the biggest in Crete. Holiday charter flights arrive at Heraklion and Chania from many European airports. There are daily flights from Athens and Thessaloniki to Heraklion and Chania and also a daily flight to Rhodes.

N. Kazantzakis airport 0030 2810 228402

Airport Police Station      0030 2810 246720

#### *By Ferry.*

Regular ferry services run from Piraeus (Athens) to ports at Heraklion and Chania. Ferries usually leave in the evening and arrive the following morning. The main ferry firms serving Crete are:

ANEK Lines, Information: <https://www.anek.gr/en/>

Piraeus 0030 210 4197510, [pr-pir@anek.gr](mailto:pr-pir@anek.gr)

Heraklion, 0030 2810 222481-2, [ira-ag@anek.gr](mailto:ira-ag@anek.gr)

Minoan Lines, Information: <https://www.minoan.gr/>

Heraklion, 0030 2810 399899, [info@minoan.gr](mailto:info@minoan.gr)

SeaJets, Information: <https://www.seajets.com/>

Piraeus 0030 210 7107710, [reservations.dpt@seajets.gr](mailto:reservations.dpt@seajets.gr), [info@seajets.gr](mailto:info@seajets.gr).

Port Police 108/ 0030 2810 244912

### Roads

Roads are good but Crete is a very large island. A major expressway runs the length of the island east/west while roads going north/south are mostly single carriageway and snake over impressive mountains and through dramatic gorges.

The main highway runs the length of Crete following the north coast. It's not dual carriageway but it is wide, well maintained and well signposted, providing easy access to the north coast beach resorts. Roads over the mountains are generally excellent but the winding roads often mean journey times are longer than expected from reading a map.

Road Help ELPA (OVELPA)      104

Road Help Express Service      154

Road Help Hellas Service      1057

Road Help Interamerican      168

Road Traffic Police 0030 2810 274080

## Transportation in the city and around

City Buses (blue) serving the city of Heraklion from early morning until late evening. Starting from the port city services operated in the archaeological site of Knossos. Information: 2810-226065 and 220795. Web: <http://astiko-irakleiou.gr/>

Intercity Buses (green) connecting Heraklion with all the counties of Crete for easy movement of residents and visitors. KTEL runs regular buses between Rethymno and Chania and there are services to many inland villages. Taxis are common and relatively cheap. Fares are regulated and metered.

Web: <http://www.ktelherlas.gr>

Information 0030 2810 246534, [info@ktelherlas.gr](mailto:info@ktelherlas.gr) , [webinfo@ktelherlas.gr](mailto:webinfo@ktelherlas.gr)

Taxi services in Heraklion.

[www.crete-taxi.gr](http://www.crete-taxi.gr)

0030 6970021970, 0030 6945027933

<https://www.herakliontaxi.com/en/index.html>,

0030 2814 003084, 0306945774937

<https://gettransfer.com/en>

[www.cretetaxi.net](http://www.cretetaxi.net)

0030 697 002 1970

crete-heraklion-kania.taxi

0030 694 491 5683

## Useful telephones

Police 100

Ambulance 166 / 0030 2810 222222

Coast Guard 108

Forest Fire Center 191

Fire Department 199

Tourist police 171/ 0030 2810 274046

Municipal Police 0030 2810 334181-5

Municipality of Heraklion 0030 2813 409000

Crete Region Tourism Division 0030 2810 246100

Post Office, Daskalogianni square, 0030 2810 234468

## Hospitals

Regional Academic Hospital- PAGNH Tel. 0030 2813 402111

Venizeleio General Hospital Tel. 0030 2813 408000

## Discover Heraklion, Crete<sup>1</sup>

The capital of Crete is a modern city, fourth in importance in Greece. Economic and cultural hub of the island, it is one of the most popular tourist resorts in Greece.



According to mythology, Zeus brought Europa, the beautiful princess, here after kidnapping her from the court of the Phoenician king. Minos came from the union of Zeus with Europa.

A visit to its important Archaeological Museum which houses the largest collection of Minoan art is mandatory. In addition, the Venetian rule of the island bequeathed to the city of Heraklion the Castle of Koules, a majestic building overlooking the port and the nearby Arsenal.

A few kilometers from Heraklion are four of the most important Minoan sites on the island: Knossos, home to the famous palace that housed Minos and the Minotaur, Phaistos, Malia and Agia Triada.

Also, very popular are the splendid beaches of the southern coast such as those near Metala, hidden among the tuff caves.

### *Geography*

Endless dreamy beaches, Venetian old towns, castles and palm groves, wild gorges and unique archaeological sites, cosmopolitan resorts and traditional recipes that have never been left in the closet.

### *Nature*

The Cretan nature is a treasure with thousands of different landscapes that you must discover and that takes time. The highest mountain of Crete has taken root deep in the soul of the Cretans. Countless local folk songs have been sung about its wild peaks, the rugged Cretans living in its villages, the way of life in the mountain pastures, the genuine Cretan soul that Psiloritis represents. Here, however, the past and the future coincide: in the Idea Cave of Psiloritis, Zeus himself found refuge and was raised, according to mythology. North of Heraklion is the small island of Dia, which has been declared a wild goat sanctuary.

### *Climate*

Although the island straddles the two climatic zones of both the Mediterranean and North African its climate is more typically Mediterranean being classified as temperate.

The summer temperatures are classically dry and hot with average temperatures between high 20s to low 30s Celsius but can reach the high 30s to mid-40s and, depending on closeness to the sea, the humidity can be high in summertime.

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<sup>1</sup> Copyright 2021 [Crete travel guide](#)

Winters are usually fairly mild although, in the mountainous regions, snow is common and



temperatures can drop to abnormally low levels.

Snow can stay on the tops of the highest mountains for the whole year but it is very rare to have snow in the low-lying regions. The southern coast of the island which includes the Mesara Plain and the Asterousia Mountain range falls within the North African climatic zone and consequently has considerably more sun and higher temperatures all year round.

## Museums and Cultural sites

The archaeological site of Knossos and the archaeological site of Heraklion are among the most important institutions in the world and are worth seeing at least once in a lifetime. Festus, Gortyna, Agia Triada and many others make cultural visits interesting and varied. Added to this are historic centers, monuments, churches and monasteries rich in history and charm. Traditional color in the unchanged villages of the hinterland for years where the sui generis Cretans respectfully maintain their traditions and their characteristic Cretan costume touches.

### *The Venetian walls of Heraklion*

The mighty 13th century Venetian walls enclose the old port of Heraklion, offering the best view of the small fortified fortress of Koule. Paying more attention to this building you will see the Lion of St. Mark carved in the stone structure, above the main gate. This pattern of Venetian power is found in many monuments in northern Italy and the Eastern Mediterranean.



### *Loggia.<sup>2</sup>*

The *Loggia* is one of the most important Venetian buildings in [Crete](#). It was a kind of gentleman's club, where the rich nobles and lords gathered. The building was built after 1541 probably with designs by *Michel Sammicheliin* Palladian style. It was then rebuilt in its current form after 1628 by *Francisco Morosini*. *Loggia is the city hall of Heraklion today.*

### *Basilica Di San Marco.<sup>3</sup>*

The Basilica of Saint Mark also known as Hagios Markos (Greek: Άγιος Μάρκος), is a former Roman Catholic church in the center of the city of Heraklion, Crete, in the Eleftheriou Venizelou Square. It was built during the Venetian rule of the island in 1239, primarily used by the local lords and officials of the island. After the Ottoman conquest of Crete in 1669, it was converted into a mosque with the name Defterdar Ahmet Pasha Mosque (Greek: Δεφτερδάρ Αχμèt Πασά Τζαμι, Turkish: Defterdar Ahmet Paşa Camii), and remained so until 1915. The building was restored after 1956 and ever since functions as a public art gallery.[1] It is one of the few Roman Catholic churches still

<sup>2</sup> [Venetian Loggia - Heraklion Town Hall - Crete Guide \(destinationcrete.gr\)](#)

<sup>3</sup> [Saint Mark's Basilica, Heraklion - Wikipedia](#)

standing in Cretan cities and towns.[2] Architecturally-wise it is a three-aisled basilica church with an elevated central nave. It has a portico in its entrance in the western façade.

#### *Morosini fountain/ Lions Square<sup>4</sup>*

One of the most brilliant monuments of the city of Heraklion. This is an impressive sculptural piece which was made in 1628, by then Provveditore Generale (Superintendent) Francesco Morosini and the engineers Zorzi Corner, Raffaello Monnani and Francesco Basilicata. Morosini was also the one who supervised and designed the construction of the aqueduct that led the water from the springs of the Archanioti gorge to the centre of Heraklion. The fountain supplied the city with more than 1,000 barrels of water a day and was named after him. The construction lasted more than 14 months and the fountain was inaugurated on April 25, 1628, on the celebration of Saint Mark, patron saint of Venice. Confusingly, the official name of Lions Square is, "Eleftheriou Venizelou Square" after the Prime Minister of Greece and leading figure in the struggles of Crete for the union with Greece.



#### *Rocca al Mare or Koules Castle<sup>5</sup>*

Two fortresses were built; in different times the current Koules, which dominates the edge of the harbor of Heraklion, and a smaller one just opposite of it, which was demolished in the early 20th century to improve the operation of the port. The small fortress built by the Venetians, for supplemental defense of Candia, was named "Rocca al Mare" (Sea Fortress). After the invention of gunpowder, the Venetians decided to create a larger building that could meet their needs. The construction was completed in 1540. The building had two floors, with 26 rooms for various uses, including prisons. The Turks, who occupied the island in 1669 renamed it 'Koules' and decided to continue its construction. It is now preserved in a very good condition and is used for cultural events.



#### *Municipal Art Gallery*

The Municipal Art Gallery include in its possession a rich Collection of Works of Art which capture the evolution of artistic creation from the beginning of its foundation in Crete, to its most recent expressions. The original core of the works was created in parallel with the founding of the Municipality of Heraklion, enriched with donations from various artists, including works by renowned, recognized artists (Fanourakis, Markogiannakis, Tsarouchis, Vassiliou, Fasianos etc) to which a large market was added. Cretan painter, Domenikos Theotokopoulos, "The Baptism of Christ". Besides, Heraklion, during the Cretan Renaissance, created the famous school of Cretan

<sup>4</sup> [Morosini Fountain \(Lions Square\) - Heraklion - Crete Guide \(destinationcrete.gr\)](#)

<sup>5</sup> [Koules, Rocca a Mare or Castello a Mare, at the port of Heraklion, Crete \(landofexperiences.gr\)](#)

Hagiography, which gave birth to worthy children, such as Dominikos Theotokopoulos, Damaskinos and so many others.

<http://www.heraklionartgallery.gr/> Information: 0030 2813 409454

#### *Heraklion Archaeological Museum*

The Herakleion Archaeological Museum is one of the largest and most important museums in Greece, and among the most important museums in Europe. It houses representative artefacts from all the periods of Cretan prehistory and history, covering a chronological span of over 5,500 years from the Neolithic period to Roman times. The singularly important Minoan collection contains unique examples of Minoan art, many of them true masterpieces. The Herakleion Museum is rightly considered as the museum of Minoan culture par excellence worldwide.

The museum, located in the town centre, was built between 1937 and 1940 by architect Patroklos Karantinos on a site previously occupied by the Roman Catholic monastery of Saint-Francis which was destroyed by earthquake in 1856. The museum's antiseismic building is an important example of modernist architecture and was awarded a Bauhaus commendation. The colours and construction materials, such as the veined polychrome marbles, recall certain Minoan wall-paintings which imitate marble revetment. The two-storeyed building has 27 galleries, a gallery for audio-visual displays, extensive modern laboratories, a cloakroom, a cafeteria and a museum shop that sells museum copies, books, postcards and slides.

The Herakleion Archaeological Museum is a Special Regional Service of the Ministry of Culture and its purpose is to acquire, safeguard, conserve, record, study, publish, display and promote Cretan artefacts from the Prehistoric to the Late Roman periods. The museum organizes temporary exhibitions in Greece and abroad, collaborates with scientific and scholarly institutions, and houses a variety of cultural events.

Information: 0030 2810 279000

#### *The Historical Museum of Crete*

The Museum was founded by the Society of Cretan Historical Studies in 1953, housed in the Andreas and Maria Kalokerinos. It's aim is to preserve and showcase the cultural heritage of Crete from early Byzantine times to the modern era. This aim has been achieved gradually, by the collection, purchase and donation of artefacts, together with artefacts on long term loan from the Ministry of Culture. The HMC now offers a composite view of Cretan history and art from the early Christian centuries to the 20th century. Temporary exhibitions cover a wide span, ranging from Byzantine to modern art, showcasing key literary figures in Greece (Elytis, Kazantzakis), and presenting major historical events from the late 19th century to the Second World War. At the same time, our educational programmes are constantly being enriched. Offered free of charge, they are a creative source of knowledge relating to the Museum's permanent collections and temporary exhibitions. Lectures, symposia, film shows and book presentations held in the amphitheatre add to activities at the Historical Museum of Crete, rendering it an outgoing, multi-faceted cultural organization.

[www.historical-museum.gr](http://www.historical-museum.gr)





### *Historical temples*

Churches of the Byzantine time, of the Venetian period, as well as later ones are still preserved today, in different parts of the city, each one having its own history, denoting the deep religious belief of the people of Heraklion during their long history. Some of the churches, like the church of St. Marc is used today as an exhibition place, while in the church of St. Aikaterini of Sinai, art works of the Cretan school of iconography are exhibited along with ecclesiastical vessels, books, sacerdotal vestments and frescoes.

### *Byzantine Museum of St. Catherine*

**Wall paintings and frescoes.** Artistic evolution in Crete ceased abruptly after the Venetian conquer in 1211, since the island became isolated from the artistic centers of the Byzantine Empire. In the period that followed local artisans remained focus to the archetypes of the past. Under these circumstances, the archaistic and usually provincial character of the Cretan wall-painting of the first period of the Venetian occupation is easily explicable. This style survived until the third decade of the 14th c., when the Cretan painting knew a new revival under the influence of the Palaiologan Renaissance.

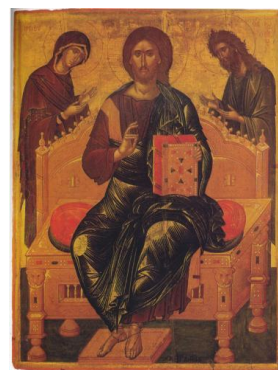
The gradual penetration of this new tendency and its further evolution, eased by the immigration



of Constantinopolitan artisans to Crete due to the ottoman threat, led into an accession of the artistic level and formatted the specific character of the artistic vague that was described under the term "Cretan School of Painting". This high quality painting is encountered in a series of churches, usually related to educated clergymen or wealthy donors, from the end of the 14th and the beginning of the 15th c. onwards.

**Icon painting in Crete.** The adoption of the wooden iconostasis, which replaced the byzantine marble templon, favored the production of icons around the end of the 14th c. The new artistic air brought to Crete by the Constantinopolitan artists that immigrated to Candia and the influence of the Western art, which was favored by the Venetian presence in the island, the trade and the growth of a rich and well educated bourgeoisie, which Arts, helped the emergence of great painters such as Andreas Rizzo, Theophanes, Michael Damaskenos and Theotokopoulos (El Greco) as well as the creation of a language in the icon-painting, which was described "Cretan School of Painting".

**Architecture and Sculpture.** When Crete was Venice established in Candia (Heraklion) the center of the island. The importance the Venetians gave evident by the fact that Candia was the first town they conquered and the last they abandoned to the hands of the Ottomans four hundred and fifty years later (1669), after a fierce resistance that lasted 21 years. The impressive economical, demographic and urban growth turned the small provincial byzantine port into one of the most important trade centers of the Mediterranean.



supported the Fine Angelos Akotantos, Dominikos specific artistic under the term

conquered in 1211, administrative to the city becomes

The predominance of the Venetian Democracy in Crete was not efficient enough to cut off the strong emotional bond between the locals and the Byzantine Empire, the only representative of the orthodoxy. The consistent efforts of Venice to enforce restrictions in religious matters amplified this anticipation. Nevertheless, the local society could not stay unaffected by the western cultural innovations imported by the conquerors.

After almost two centuries of revolution movements, the Cretans came to realize that the Venetian occupation was not to be defeated. The peaceful period that followed the “rebellion of St. Titus” (1363-1366) allowed the two sides to approach each other. Nevertheless, the persistence of Venice to impose a union between the Orthodox and the Catholic Church soon led into a new agitation. The consciousness of the common origin, language and religious dogma between the Cretans and the rest of the byzantine populations reinforced their resistance towards the assimilation.

The ideological guidance of Constantinople ceased to exist with the Fall of the Byzantine Empire in 1453. Though the memories stayed alive, soon it became obvious that Venetians and Cretans had to stand equally against the common enemy, the threat of the Ottoman Empire. Local population felt for the first time secure under the flag of Saint Marcus. Leaving behind all the differences, they managed to mingle western renovations with the byzantine tradition in a creative amalgam that was expressed in a unique way through the Cretan art and architecture.

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