

**CONFERENCE PROGRAMME**

**HOTEL PLAZA VENICE MESTRE |**

**Viale Stazione, 36 | 30171 Venezia Mestre | Italy |**

 **tel 0039 041 92 93 88 | fax 0039 041 92 93 85 |**

**www.hotelplazavenice.com**

**Monday, June 19, 2023**

**20:00-21:00
Welcome Cocktail**

**CONFERENCE PROGRAMME**

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**Tuesday, June 20, 2023**

**08.00-08.30
Registration**

**Distribution of the Conference bags**

**Certifications**

**Conference Room A'**

| **Time: 08.30-08:50** |
| --- |
| **Rolling Bearing Fault Diagnosis Based on DWT-BPNNby Yang Peixi** |

| **Time: 08:50-09:10** |
| --- |
| **Analysis Model of Competencies of Graduates in Labor Market Needs by Data Miningby Chonnikarn Rodmorn, Mathuros Panmuang** |

| **Time: 09:10-09:30** |
| --- |
| **Identification Of Nonlinear System Composed Of Parallel Coupling Of Wiener and Hammerstein Modelsby Adil Brouri, Hafid Oubouaddi** |

| **Time: 09.30-10:50** |
| --- |
| **On the Performance of Extended EWMA Control Chart based on Moving Average Model with Exogenous Variablesby Saowanit Sukparungsee, Yupaporn Areepong** |

| **Time: 10:50-10:10 (Plenary Speech)** |
| --- |
| **Integrated Modeling and Simulation in IoT Platforms****Prof. Dr. Ivan GanchevTelecommunications Research Centre (TRC), University of Limerick, Limerick, Ireland, University of Plovdiv “Paisii Hilendarski”, Plovdiv, BulgariaInstitute of Mathematics and Informatics – Bulgarian Academy of Sciences, Sofia, Bulgaria. E-mail: Ivan.Ganchev@ul.ie** |

| **Time: 10:10-10:40 (Plenary Speech)** |
| --- |
| **Optimal and Robust State Estimation: Batch and Recursive Approaches****by Professor Yuriy S. ShmaliyPh.D, Dr.Sc, IEEE Fellow, AAIA FellowDepartment of Electronics EngineeringUniversidad de Guanajuato,DICIS, Salamanca, 36885, MexicoE-mail: shmaliy@ugto.mx** |

| **Poster Presentations** |
| --- |
| **New 3D Visualization Technologies as a Part of Scientific Gateway and Portalby Eva Pajorova, Ladislav Hluchy** |

**10:40-11:00
Coffee Break**

**Conference Room A'**

**MOSIDA I (3rd International Workshop on "MOdelling, SImulation and DAta Analysis in Engineering and Physics Applications" (MOSIDA 2023)**

**Organizers-Chairmen: Claudio Guarnaccia, University of Salerno, Salerno, Italy and Domenico Rossi,University of Salerno, Salerno, Italy**

| **Time: 11:00-11:20** |
| --- |
| **Mathematical model for simulations of heat transfer through a conductive pipeby Eduard Marusic-Paloka** |

| **Time: 11:20-11:40** |
| --- |
| **Simplified thermal modelling for optimal thermal control strategy of buildingsby Carmela Concilio, Mario Saporoso, Claudio Guarnaccia and Gennaro Cuccurullo** |

| **Time: 11:40-12:00** |
| --- |
| **Numerical validation of an energetic dam-break induced flow on a bridge cross section using the SPH methodby Giorgia Catherina Goursand-Parente, Salvatore Capasso, Bonaventura Tagliafierro, Corrado Altomare, Giacomo Viccione** |

| **Time: 12:00-12:20** |
| --- |
|  **Comparison of Baseflow Separation Methods in the Conterminous United Statesby Leisan Khasanova, Antonia Longobardi** |

| **Time: 12:20-12:40** |
| --- |
| **Road Traffic Noise Predictions by means of L10 Modelling with a Multilinear Regression Calibrated on Simulated Databy Domenico Rossi, Aurora Mascolo, Claudio Guarnaccia**  |

| **Time: 12:40-13:00** |
| --- |
| **The use of numerical methods for mathematical modeling of the tectonic structure of the lithospheric subduction of the Adriatic micro-plate as a possible physical mechanism of hydrocarbon upwelling by S.V. Gavrilov, A.L. Kharitonov** |

**Conference Room A'**

**MOSIDA II (3rd International Workshop on "MOdelling, SImulation and DAta Analysis in Engineering and Physics Applications" (MOSIDA 2023)**

**Organizers-Chairmen: Claudio Guarnaccia, University of Salerno, Salerno, Italy and Domenico Rossi,University of Salerno, Salerno, Italy**

| **Time: 13.20-13:40** |
| --- |
| **An Alternative Approach in the Skull Density Ratio (SDR) Computation Used in MRgFUS Treatments: A Preliminary Studyby Lilla Bonanno, Denis La Fauci, Luca Vernaci, Annalisa Militi, Chiara Smorto, Francesco Campanella, Maria Antonietta D Avanzo, Valentina Hartwig, Carmelo Anfuso, Silvia Marino and Giuseppe Acri** |

| **Time: 13:40-14:00** |
| --- |
| **Data Augmentation to Improve the Soundscape Ranking Index Predictionby Roberto Benocci, Andrea Potenza, Giovanni Zambon, Andrea Afify, H. Eduardo Roman** |

| **Time: 14:00-14:20** |
| --- |
| **Diesel and Bi-Fuel Probe Vehicles Noise Emission Assessment as a Function of Speed, Gear and RPMby Antonio Pascale, Aurora Mascolo, Domenico Rossi, Simona Mancini, Margarida Coelho, Claudio Guarnaccia** |

| **Time: 14:20-14:40** |
| --- |
| **The assessment of the public and private conveniences in the urban transformation interventions: an optimization model for the value recapture adoption****by Pierluigi Morano, Francesco Tajani, Debora Anelli, Emma Sabatelli** |

| **Time: 14:40-15:00** |
| --- |
| **Financial Models For The Effectiveness Of Urban Regeneration Initiativesby Francesco Tajani, Pierluigi Morano, Felicia Di Liddo** |

| **Time: 15:00-15:20** |
| --- |
| **Development of a pre-diagnosis procedure for the evaluation of indoor radon potential in buildingsby Simona Mancini, Michele Guida** |

**15:20-15:40
Coffee Break**

 **Conference Room A'**

**MOSIDA III (3rd International Workshop on "MOdelling, SImulation and DAta Analysis in Engineering and Physics Applications" (MOSIDA 2023)**

**Organizers-Chairmen: Claudio Guarnaccia, University of Salerno, Salerno, Italy and Domenico Rossi,University of Salerno, Salerno, Italy**

| **Time: 15:40-16:00** |
| --- |
| **Acoustic Emission Technique for Localizing the Structural Damage of Prestressed Reinforced Concrete Beamby Antonella B. Francavilla, Daniele Pierro, Domenico Rossi, Massimo Latour, Claudio Guarnaccia, Gianvittorio Rizzano** |

| **Time: 16:00-16:20** |
| --- |
| **Acoustic Emissions Detection and Analysis during a 4 Points Bending Test on a Reinforced Concrete Beamby Paola Barra, Antonella B. Francavilla, Domenico Rossi, Massimo Latour, Claudio Guarnaccia, Gianvittorio Rizzano** |

| **Time: 16:20-16:40** |
| --- |
| **Comparison of Radioactivity and Metal Pollution Concentrations in Marine Sediment Samples Obtained from the Aegean Sea (Türkiye) and the Calabria Region (Italy)by Serpil Aközcan, Simona Mancini, Selin Özden, Valentina Venuti, Francesco Caridi, Giuseppe Paladini, Michele Guida** |

| **Time: 16:40-17:00** |
| --- |
| **Evaluation of the radiological risk linked to the external exposure to radioactivity in construction materials of the Giudecca urban section (Bova, Reggio Calabria, Italy)by Francesco Caridi, Giuseppe Paladini, Salvatore Procopio, Pasquale Faenza, Vincenza Crupi, Giuseppe Sabatino, Alessandro Tripodo, Domenico Majolino, Valentina Venuti** |

| **Time: 17:00-17:20** |
| --- |
| **Health risk assessment due to inhalation of heavy metals in PM10 in urban ambient air in San Francisco de Campeche, Campecheby María de Guadalupe Vargas Canto, Julia Griselda Cerón Bretón, Alberto Antonio Espinosa Guzmán, Rosa María Cerón Bretón, Claudio Guarnaccia** |

| **Time: 17:20-17:40** |
| --- |
| **Measurements and mapping natural radioactivity in the city of Najaf, Al-Najaf Governorate (Iraq), by using track detector CR-39 and geographical information system (GIS)by Lubna A. Alasadi, Ali Abid Abojassim, Michele Guida, Simona Mancini** |

| **Time: 17:40-18:00** |
| --- |
| **Radioactivity Content and Ionizing Radiation Hazard Assessment of Dairy Derivatives Consumption in Italyby Francesco Caridi, Giuseppe Paladini, Giovanna Belmusto, Valentina Venuti, Domenico Majolino** |

| **Time: 18:00-18:20** |
| --- |
| **An Integral Equation Approach for Average Run Length of Incorporation of Exogenous Variable in Seasonal Autoregressive Fractionally Integrated Modelby Wilasinee Peerajit** |

| **Time: 18:20-18:40** |
| --- |
| **Improved Ratio Type Estimators Using Some Prior Information in Sample Surveys: A Case Study of Fine Particulate Matter in Thailandby Nuanpan Lawson** |

| **Time: 18:40-19:00** |
| --- |
| **Explicit Formulas of Average Run Lengths of Moving Average Control Chart for INARCH (1) Poisson Counting Processesby Yupaporn Areepong, Saowanit Sukparungsee** |

|  **Time: 19:00-19:20** |
| --- |
| **Performance of Reduced and Real-Time Models for Simulations of Material Processes by Amir M Horr** |

**20:00-23:00
Conference Dinner**

 **More Details for the Conference Dinner will be given to you in the conference**

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**Wednesday, June 21, 2023**

**08.00-08.30
Registration**

**Distribution of the Conference bags**

**Certifications**

**Conference Room A'**

| **Time: 08:00-08:20** |
| --- |
| **Analysis of Deep Learning Methods for Cybersecurity in Industry 4.0****by Evgeni Sabev, Roumen Trifonov, Galya Pavlova, Kamelia Raynova** |

| **Time: 08.20-08:40** |
| --- |
| **X-Ray Images Analytics Algorithm Based on Machine Learningby Veska Gancheva, Ivaylo Georgiev, Violeta Todorova** |

| **Time: 08:40-09:00** |
| --- |
| **Functionalization of carbon nanotube synthesised using a microwave ovenby Ahmad M. AL-Diabat , Natheer A. Algadri , Naser M. Ahmed, Adnan H. Alrajhi, Abdulsalam Abuelsamen , Amal Mohamed Ahmed Ali, Salma Abdulrhman Al-wasli.** |

| **Time: 09:00-09:20** |
| --- |
| **Analysis of Modern Security Plugins for WordPressby Georgi Stoyanov, Adelina Aleksieva-Petrova, Milen Petrov** |

| **Time: 09.20-10:00** |
| --- |
| **An effect of Brinkman ratio in Boussinesq-Stokes suspensions fluid flow due to a porous stretching /shrinking sheet with heat transfer: Analytical solution****byA.B. Vishalakshi, U. S. Mahabaleshwar, Zainab Ali, G. V. Bognar** |

| **Time: 10:00-10:20** |
| --- |
| **Micropolar fluid flow due to porous stretching /shrinking sheet with mass transpiration: Analytical method****by Rishu Garg, Jitender Singh U. S. Mahabaleshwar Okhunjon Sayfidinov, G. V. Bognar**  |

| **Time: 10:20-10:40** |
| --- |
| **An Mhd Effect Biviscous Bingham Fluid Flow and Heat Transfer Over A Stretching/Shrinking Sheet With Velocity Slip and Temperature Jump****by K. N. Sneha,, U. S. Mahabaleshwar, Krisztián Hriczó, Gabriella Bognar** |

**10:40-11:00
Coffee Break**

 **Conference Room A'**

| **Time: 11:00-11:20** |
| --- |
| **Forest Fire Detection System based on Low-Cost Wireless Sensor Network and Internet of Thingsby Ali Al-Dahoud, Mohamed Fezari, Ahmad AA Alkhatib, Mohamed Nadir Soltani, Ahmed Al-Dahoud** |

| **Time: 11:20-11:40** |
| --- |
|  **Machine learning in Renewable Energy Application: Intelligence System for Solar Panel Cleaningby Ahmad Al-Dahoud, Mohamed Fezari, Ali Al Dahoud** |

| **Time: 11:40-12:00** |
| --- |
| **Platform for Learning and Virtual Reality in Animal Husbandryby Veska Gancheva, Lidia Galabova** |

| **Time: 12:00-12:20** |
| --- |
|  **Forest Fire Detection System based on Low-Cost Wireless Sensor Network and Internet of Thingsby Ali Al-Dahoud, Mohamed Fezari, Ahmad AA Alkhatib, Mohamed Nadir Soltani, Ahmed Al-Dahoud** |

| **Time: 12:20-12:40** |
| --- |
| **The Application of Splines of the Seventh Order Approximation to the Solution of Integral Fredholm Equations (online Presentation)by I.G.Burova, G.O. Alcybeev** |

| **Time: 12:40-13:00** |
| --- |
|  |

**Conference Room A' International Workshop on Nanobubble Generation and Chemical Physics**

Organizer-Chairman:**Amr Abdel-Fattah (Saudi Aramco), Niall J. English (UCD & AquaB), Email: amr.abdelfattah@aramco.com, niall.english@gmail.com**

| **Time: 13.20-13:40** |
| --- |
| **Study the Evolution of Nano-Bubbles/Droplets Generated in Water by CO2 Hydrate Dissociation via Molecular Dynamics Simulationby P. Naeiji, NJ English** |

| **Time: 13:40-14:00** |
| --- |
| **Long-time water aeration by electrostriction-generated nanobubblesby Omid Saremi, Donagh Tuite, Niall J. English** |

| **Time: 14:00-14:20** |
| --- |
| **Dynamic evolution of metastable CO2 nanobubbles generated by external electric fieldMengdi Pan, Niall J. English** |

| **Time: 14:20-14:40** |
| --- |
| **Enhancement of calorific performance of internal combustion engines by air nanobubbles in petroleumby N.J. English** |

| **Time: 14:40-15:00** |
| --- |
| **Water nano-carbonation by CO2 infusion into submersible and pipe-flow nanobubble generators: the rise and fall of dissolved CO2by Shiv Sangaru, Amr Abdel-Fattah, Niall J. English** |

**15:20-15:40
Coffee Break**

 **Conference Room A'**

| **Time: 15:40-16:00** |
| --- |
| **Analysis of Deep Learning Methods for Cybersecurity in Industry 4.0****by Evgeni Sabev, Roumen Trifonov, Galya Pavlova, Kamelia Raynova** |

| **Time: 16:00-16:20** |
| --- |
| **Pore pressure and in-situ stress magnitudes with Image Log Processing and Geological Interpretation in the Haoud Berkaoui hydrocarbon field, northeastern Algerian Sahara.****by Rafdik Baouche** |

| **Time: 16:20-16:40** |
| --- |
| **A study of burdens of construction projects in developing nations****by Olufemi Oyedele** |

| **Time: 16:40-17:00** |
| --- |
| **Optimal water transfer in a system of interconnected rivers for water resources management****by Ashok K Keshari, Richa Pandey** |

| **Time: 17:00-17:20** |
| --- |
| **Effects of Air and Fuel Arrangement on the Thermal and Aerodynamic Characteristic of Asymmetric Vortex Flame****by Raid Abid Alwan** |

| **Time: 17:20-17:40** |
| --- |
| **Assessment Of The Environmental Impact Of Harmful Substances In The Process Of Cement Production****by Keldiyarova Gulmira Farxadovna** |

| **Time: 17:40-18:00** |
| --- |
| **Automated EEG classification using machine learning approaches****by Ahmad al-Qerem** |

| **Time: 18:00-18:20** |
| --- |
| **Simulation of thermoforming of fiberglass composites in thermoplastic matrix****by Rabah Ferhoum , Madjid Almansba** |

| **Time: 18:20-19:00** |
| --- |
| **Sustainable Agriculture/Food Waste Is Neither A Risky, Nor An Uncertain/Impossible Business Since 1975 At Liaqat Corp (Pvt) Ltd , By Field-Based Mobile Commercial Innovative Industrialization For Zero Food Waste At Tech Transfer Basis****by Liaqat Ali, Doctor Aftab Arslan, Talha Saeed** |

| **Time: 19:00-19:20** |
| --- |
| **Chair- physical based exercises as ideal active break healthy cardio moves lifestyle among Algerian secretary****by** **Mohammed Zerf, Koutchouk Sidi Mohamed** |

| **Time: 19:20-19:40** |
| --- |
| **Scalable Flow based Management Scheme in Software Define Network (SDN) using sFlow. (online Presentation) by Adeniji Oluwashola David, Oluwabusayo Israel, Omotosho** |

 **Conference Room B'**

| **Time: 15:40-16:00** |
| --- |
| **Receiver-Initiated RTS/CTS Control for Even Transmission Opportunities of Data Messages among Neighbor Wireless Nodes****by Hiroaki Higaki** |

| **Time: 16:00-16:20** |
| --- |
| **Implicit Finite Difference Scheme for Solving Fractional Reaction-Diffusion Equation: Codes Matlab** **by Bendib Issam, Boudjedour Allaoua** |

| **Time: 16:20-16:40** |
| --- |
| **Ultrasound assistance synthesis of Optimized ion imprinted polymer for Efficient and selective removal of cobalt Ions from waste Streams** **by Mahmoud Hamed** |

| **Time: 16:40-17:00** |
| --- |
| **Study and performance analysis of small scal Fresnel solar organic cycle coupled withe brakish water desalination unit in isolated arid area in southern of Algeria****by Mohammed Laissaoui, Housseyn Karoua, Bouhallassa Amar, Lecheheb Sabrina** |

| **Time: 17:00-17:20** |
| --- |
| **Impact of Transfer Learning Compared to Convolutional Neural Networks on Fruit Detection** **by Razan Hamdy, Nesma AbdelAziz, Dina Salem**  |

| **Time: 17:20-17:40** |
| --- |
| **New Intelligent Neural Network Program Developed Based on Revolutionary Predictive Control for a System Tracking by Wassila Issaadi, Salim Issaadi** |

| **Time: 17:40-18:00** |
| --- |
| **Modelling, simulation and emulation of PEM Fuel Cell by Riad Moualek, Nacereddine Benamrouche, Nabil Benyahia, Amar Bousbaine** |

| **Time: 18:00-18:20** |
| --- |
| **Simulation of thermoforming of fiberglass composites in thermoplastic matrix****by Rabah Ferhoum, Madjid Almansba** |

| **Time: 18:20-19:00** |
| --- |
| **Parameter estimation of system composed by the series connection of linear and nonlinear elements by F.Z. El Mansouri, A. Brouri , H. Oubouaddi**  |

| **Time: 19:00-19:20** |
| --- |
| **Mechanical Behavior of femur neck under different loadings: Numerical investigation by Bencheikh Elhocine Hala** |

**Conference Room C'**

| **Time: 16:00-16:20** |
| --- |
| **Asymptotic Properties of Estimating Parameters of Intensity Function and Maintenance Effectby Makram Krit** |

| **Time: 16:20-16:40** |
| --- |
| **Effects of Air and Fuel Arrangement on the Thermal and Aerodynamic Characteristic of Asymmetric Vortex Flameby Raid Abid Alwan** |

| **Time: 16:40-17:00** |
| --- |
| **Principal Component Analysis as a Tool to Classify the Ground Water of the Fazilka District, Punjab, India****by Uma Kamboj, Reena Rani, Neha Munjal** |

| **Time: 17:00-17:20** |
| --- |
| **Simulation Dissociative electron attachment in few-body approximationby S.Pozdneev** |

| **Time: 17:20-17:40** |
| --- |
| **Chair- physical based exercises as ideal active break healthy cardio moves lifestyle among Algerian secretary****by** **Mohammed Zerf, Koutchouk Sidi Mohamed**  |

| **Time: 17:40-19:00** |
| --- |
| **A Relational DataBase based Enterprise Transformation Projectsby Antoine Trad (online Presentation)**  |

| **Time: 19.00-19:20** |
| --- |
| **An Architecture and Development Process based Enterprise Transformation Projects (ADPbETP)by Antoine Trad (online Presentation)**  |

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**Thursday, June 22, 2023**

**Time: 09:00-18:20**

**Full Day tour in Venice in June 22 with Lunch**

**70 EUR / person (not included in the registration fees)**

**About MOSIDA:**

**3rd International Workshop on "MOdelling, SImulation and DAta Analysis in Engineering and Physics Applications" (MOSIDA 2023)**

Organizers-Chairmen: Claudio Guarnaccia (UNISA), Domenico Rossi (UNISA)

Aim: The interest towards modelling and simulation in Engineering and Physics problems, as well as data analysis, is increasing a lot in the last years, thanks to the new technologies for big data treatment and computation. The workshop aims at sharing the latest research and results about modelling, simulation and data analysis in various applications, in the field of Engineering and Physics, fostering an interdisciplinary approach. In the last edition we had 19 presentations and were able to arrange 2 successful sessions. We hope to repeat this great experience thanks to your participation and support.

Topics:

- Modeling and simulation in Physical problems;

- Modelling and simulation in Engineering problems;

- Online and offline data analysis in various applications;

- Exploratory data analysis and data mining;

- Models implementation, calibration and testing;

- Residuals and error analysis;

- Other topics related to the aims of the session.

**About the International Workshop on Nanobubble Generation and Chemical Physics**

Organizer-Chairman: Amr Abdel-Fattah (Saudi Aramco), Niall J. English (UCD & AquaB), Email: amr.abdelfattah@aramco.com, niall.english@gmail.com

Aim: One of the key properties of nanobubbles is their longevity and long-term stability- while larger bubbles rise to the atmosphere very quickly, nanobubbles have potential lifetimes of hours to months. This unique characteristic makes them important to and capable of transforming a variety of environmental, medical, and industrial processes.

This workshop considers new and innovative methods for generation of nanobubbles of different gasses, as well as rigorous exploration, elucidation and characterisation of their underlying microscopic fundamentals – in terms of molecular and condensed-matter physics, key chemistry and, of course, their time-dependent biological and statistical behaviour. A keen eye towards exploiting and manipulating their formation with a view to end-goal engineering applications will also be explored, in addition to important industrial and environmental applications.

Topics:

- Methods of generation and characterization of nanobubbles in different solutions

- Stability, mobility, structure, dynamics, electrostatics, and electrokinetics of nanobubbles and effect of surrounding environment’s conditions

- Statistical properties of nanobubble populations – including lifetimes and coalescence

- Chemical properties, such as reactive species and catalysis of chemical reactions

- Nanobubbles in biological systems and their effects on behavior

- Acoustic perturbation and characterization of nanobubbles

- Modeling and simulation of nanobubble dynamics

- Existing and emerging applications of nanobubbles

**VENICE**

The city of Venice spreads out over a series of 119 islands that are located in the Venetian Lagoon – a vast body of salt water separated from the Adriatic Sea by a long piece of land. This part of Italy was inhabited by a few Illyrian tribes and the Veneti that lived on stilt houses in the Lagoon and lived off fishing and extracting salt from the Lagoon.

Venezia was founded in 421. The Veneti, who had been expelled by the Ostrogoths and the Lombards, took refuge in these marshlands in the mouth of the River Po, forming the city of Venice.

The city’s “privileged” site in the middle of a swamp gave it a great independence and made it very difficult for those that wanted to seize the land. In 810 Charlemagne’s own son (Pepin of Italy and king of the Lombards) had to withdraw from the Lagoon after six months of siege.

During the sixth century Flavius Belisarius, the general of the Byzantine Empire conquered Venice. Under the protection of the Eastern Roman Empire, Venice became part of the Exarchate of Ravenna.

In 697, the wealthy families of Venice took advantage of the Exarchate's weakened position to place the first doge Anafestus Paulicius in power. The position of the doge was at first hereditary and lifelong. Later, after several power struggles between the city’s patrician families, the doges were elected.

In 829, the relics of Saint Mark the Evangelist were stolen from Alexandria in Egypt and smuggled to Venice. San Marco would become the city’s patron saint and the relics safeguarded in St Mark's Basilica.

A devastating fire destroyed the city centre in 976, including the Doge’s Palace with all the archives of the city and the first church dedicated to San Marco.

Constantinople granted Venice trading privileges in the Eastern Roman Empire in return for helping the Byzantine Emperor resist the Norman incursions.

This fruitful relationship and trading allowances guaranteed Venice important commercial ties with other regions and countries. The Venetian ambassador had exclusive concessions with Byzantium and his diplomacy was characterized by his sagacity, flexibility and opportunism. An example of these privileges is that the Venetians kept on trading with the Muslim world, even when the Lateran councils had prohibited it.

Venice’s power increased thanks to the commerce of the following materials: spices and silk from Constantinople and Alexandria, transporting slaves, wood, fish from Dalmatia and iron from the Alpes. One of their most successful businesses was buying slaves from the south of Russia to sell them in North Africa. Venice would also sell the slaves it would buy from Turkey and Alexandria in Europe.

Venice became an imperial power and established the Latin Empire as a consequence of the fourth crusade that took place between 1202 and 1204. The Venetian galley ships led by Enrico Dandolo captured and brutally sacked Constantinople. The Greek Empire was then divided up between the crusaders and Venice. Numerous commercial areas of Syria, Palestine, Crete and Cyprus were handed over to Venice. It was during this period that Marco Polo, a Venetian merchant reached China and wrote a book about his travels.
Once Venice controlled the Mediterranean, it turned its attention to the Atlantic, reaching Southampton, Bruges and London, where the Venetians established their colonies.

In 1284, Venice introduced gold ducats (coins) that were used as a trade coin in Europe for the next three centuries, along with Florence’s Florin.

**Political organization of the Republic of Venice:** The Old Serenissima Republic of Venice

From the beginning, the Republic of Venice strove to ensure that the doge would never have complete power over the city. A form of Republican government was established in Venice that didn’t exist in any other part of Italy. The patricians did not want to be governed by just anyone, especially when it didn’t benefit their financial interests.

From 1148 onwards, the Venetians forced every doge to sign the “Doge’s Promise”, an agreement which he had to fulfil as soon as he was elected.

In 1177, the Great Council was introduced to diminish the influence of certain great families. The council was made up by selected members of the nobility. Years later it was followed by the Minor Council that consisted of six members that became the doge’s advisers. And The Quarantia (The Council of the Forty) which was the Supreme Court.

These institutions were then merged by the doge with the creation of the Signoria of Venice in 1223. The Serenissima Signoria was the Republic of Venice’s supreme body of government and guaranteed the continuity of the Republic, as is represented in the expression: “The Doge is dead, but not the Signoria”.

In 1229, a senate, the Consiglio dei Pregadi, was formed. It consisted of 60 members that were elected by the Major Council. From this senate, Venice’s foreign affairs were determined and the ambassadors elected.

A Council of Ten was established in 1310. This organization was similar to a secret state police. Throughout the years, it became very powerful and turned into the central political body in Venice.

“Collegios” were formed by various representative groups of Venice. These created an executive branch.

In fact, the doge had very little power and most of the decisions were made by the Major Council. The members of the Great Council of Venice were passed from father to son from 1297 onwards.

An oligarchy of two hundred families began to govern Venice.

Threatened by the power of the Duke of Milan, Venice began to conquer other parts of Italy during the first half of the fifteenth century.

In 1410, Venice controlled most of the region including Verona and Padua, reaching eventually Brescia and Bergamo. The Adriatic Sea became the “Venetian Sea” and the power of Venice extended to other countries like Cyprus.

The weakness of the Byzantine Empire allowed Venice to acquire control over Crete, Cyprus (in 1498) and Eubea.

During the fifteenth century, Venice was at the centre of the world’s commerce and had the largest port in the world with over 200,000 inhabitants. The wealthiest families had beautiful palazzos built by artists like Veronese and Giorgione.

Venice had reached its maximum peak during this period.

**Decline**

If the sacking of Constantinople marked the date from which Venice grew and became an imperial power, then the city’s long decline began when it lost Constantinople to Sultan Mehmet II in 1453. Another important factor that hit Venice hard was the exploration of the Americas in 1492 and Vasco da Gama’s discovery of the sea route to India.

During this period, the Ottoman Empire conquered the Balkans and Venice’s new territory was threatened. Finally, in 1570, the Venetians had to abandon Cyprus leaving it to the Turks. In the following years, Crete and other Venetian territories were also seized by the Ottomans. In 1573, the Republic of Venice signed a peace treaty with the Ottoman Empire, which ended the Ottoman and Venetian war.

Thanks to the Holy League, allied with the Holy See and Spain, Venice tried to retrieve its lost territory and, even though it won the Battle of Lepanto against the Ottoman Empire, it was unable to reconquer any land.

In addition, Venice had confronted the Pope when expanding its territory in Italy which led to great tensions. At the time, the Pope had very powerful allies such as Louis XII of France, the Holy Roman Emperor Maximilian II and Ferdinand II of Aragon. But finally, Venice’s diplomacy saved it from an important confrontation with the Pope.

Lastly, the Plague of 1629-31 wiped out a third of the population. Venice was so diminished that Naples tried to conquer it through the Bedmar conspiracy and the Habsburg fostered the Port of Trieste to weaken Venice even further.

**The conflict for Venice**

During the eighteenth century, Venice was a shadow of its former self. It tried to recover its lost influence by declaring war against Tunisia, but in May 1797, Napoleon conquered Venice. During the following years France and Austria fought for dominion over the city.

In 1797, Napoleon Bonaparte tried to take sides with Venice, but the city refused. Napoleon took revenge by putting an end to three centuries of independence. He sacked the Bucentaur (the doge’s state barge), stealing all the gold and precious stones he found. The barge was then sailed to France where it was used as a galley for prisoners.

The Doge Ludovico Manin and the Great Council abdicated and a pro-French municipal government was put in place. Napoleon organized the Cisalpine Republic in Italy and became its president. A few years later, Napoleon proclaimed himself Emperor of France and became King of the Kingdom of Italy.

By the Treaty of Campo Formio (12 October 1797), Venice came under the Austrian Empire.

Napoleon regained power over Venice from the Austrians in 1805 by the Treaty of Pressburg and it became part of the Kingdom of Italy. A year later, Napoleon placed his brother Joseph Bonaparte as head of Venice. As a result of being placed under French dominion, an intense Italian nationalist sentiment developed.

In 1814, Napoleon was defeated and once again the Serenissima was returned to Austria, under the Kingdom of Lombardy-Venetia. Years later, Venice was detached from Lombardy that had opted for the unification of the Kingdom of Italy.

The nationalist sentiment spread quickly and secret societies formed that searched for ways of unifying Venice with the rest of Italy. Two of the most important societies were called Young Italy and the Carbonari.

Various uprisings were organized by these societies. However, the Austrian army defeated the revolutionaries in the Rieti Battle in 1821. Ignoring what had taken place during the Battle of Rieti, new insurrections took place in Piamonte, Turin, Modena and Parma on 11 March.

After the Battle of Rieti, an assembly was formed that voted for the unification of Venice to Italy. As a result, the Austrians destroyed a large part of the city and Venice surrendered on 22 August 1849.

The uprising escalated quickly and the war expanded to include all of Italy against Austria. The Duchy of Milan, the Pope and the King of Naples sent reinforcements to fight against the Austrians. The Austrians, on the other hand, were helped by the Holy Alliance.

In 1866, the Treaty of Vienna was signed and the Austrians ceded Venice to France, which would then give it back to the Kingdom of Italy.

**Venice became part of the Kingdom of Italy in 1866.**

**After the unification of Italy**

On 19 April 1893, the City Council of Venice and the mayor Riccardo Selvatico passed a resolution to create a national art exhibition in the Lagoon. The first Venice Biennale was inaugurated on 30 April 1895. Today, it is one of the most renowned art exhibitions in the world.

The Serenissima suffered great urban and territorial changes at the beginning of the twentieth century. In 1917, a part of Mestre was added to Venice. The Italian government decided to develop a residential area on Porto Marghera.

In 1933, the Ponte della Libertà was built and hence, the road connecting Venice to Padua. The Corso del Popolo was constructed to connect it to Mestre and part of the Canal Salso was interrupted.

After World War II, an important urban expansion took place in the city’s surroundings. During the same period, many inhabitants that lived in the heart of Venice moved to Mestre, especially in the seventies and after the floodings of 1966.

A tornado registered as F5 on the Fujita scale struck Venice on 11 September 1970 killing 21 people and destroying much of the city centre.

Today, the biggest economy in Venice is based on tourism. The city is also an important cultural hub thanks to La Biennale, the Film Festival and one of the most prominent universities in Italy, Ca’ Foscari. Nevertheless, the Serenissima suffers from a high percentage of its population leaving the city due to the negative impact of a mass tourism and the high prices of the city.