# Proposal for a Short-Term Internship Program of Uzbek Young Scientists at the University of Padova (Italy)

**Suggested Research Topics**

**1. Department of Land Environment Agriculture and Forestry (TESAF)**

**Location: Campus of Agripolis, viale dell'Università 16, 35020, Legnaro (PD)**

**Scientific supervisor: Associate Prof. Francesco Pagliacci**

| No. | Program name | Maximum number of participants | Internship period | Program details (what will young scientists learn from the program) |
|---|---|---|---|---|
| **1** | Rural Development and Agricultural Diversification: Strategies for Building Resilient Rural Communities in Uzbekistan | 1 | 2 months | The project will focus on rural development and economic diversification strategies to enhance the resilience and sustainability of rural communities in Uzbekistan. It will examine both farm and non-farm activities, including crop and livestock diversification, value-added agri-food processing, rural tourism, agri-tourism, renewable energy initiatives, and digital innovation, with the aim of strengthening rural livelihoods and creating new employment opportunities. During the research stay, the visiting researcher will analyze European and Italian rural development policies and best practices, assess their applicability to the Uzbek context through comparative analysis, and develop policy recommendations to support sustainable rural development and initiatives of economic diversification. |

**2. Department of Land Environment Agriculture and Forestry (TESAF)**

**Location: Campus of Agripolis, viale dell'Università 16, 35020, Legnaro (PD)**

**Scientific supervisor: Full Prof. Paolo Tarolli**

| No. | Program name | Maximum number of participants | Internship period | Program details (what will young scientists learn from the program) |
|---|---|---|---|---|
| **1** | Integrated Satellite Remote Sensing and Ground Monitoring for the Detection of Drought and Salinity Stress in Agricultural Systems | 1 | 2 months | Drought and soil salinization are among the major threats to agricultural productivity and sustainability. This project aims to investigate the use of satellite-based Earth Observation data integrated with ground measurements for the early detection, monitoring, and assessment of drought and salinity stress in agricultural systems. The research will combine multispectral satellite imagery with field observations of soil properties and environmental conditions to improve the accuracy of stress detection and support sustainable crop and water management. During the research stay, the visiting researcher will gain experience in the integration of satellite-derived indicators with ground-based observations, contributing to the development of robust methodologies for monitoring crop stress that can be applied across different agricultural systems. |

**3. Department of Agronomy Food Natural Resources Animals and Environment (DAFNAE)**

**Location: Campus of Agripolis, viale dell'Università 16, 35020, Legnaro (PD)**

**Scientific supervisors: Associate Prof. Alberto Pozzebon, Associate Prof. Nicola dal Ferro**

| No. | Program name | Maximum number of participants | Internship period | Program details (what will young scientists learn from the program) |
|---|---|---|---|---|
| **1** | Remote and proximal sensing tools for the management of biotic and abiotic stresses in agricultural crops. | 1 | 2 months | Sustainability in agriculture requires advanced technologies to address the challenges posed by climate change and the associated biotic and abiotic stresses. Remote sensing, based on both multispectral and hyperspectral sensors, is becoming a key tool for crop monitoring and management. It can improve agricultural efficiency while reducing environmental impacts by optimising irrigation, fertilisation, pest monitoring, and pest management. During the research stay, the visiting researcher will focus on two main areas: i) the early detection of pest infestations; and ii) the monitoring of crop nutritional status. |

**4. Department of Surgical Oncological and Gastrointestinal Sciences**

**Location: Via Giustiniani 2, 35128 Padova**

**Scientific supervisor: Dr. Luigi Dall'Olmo**

| No. | Program name | Maximum number of participants | Internship period | Program details (what will young scientists learn from the program) |
|---|---|---|---|---|
| **1** | Internship in Surgical Oncology | 1 | 2 months | Melanomas and soft tissue sarcomas are aggressive oncological diseases, whose local control is based on surgical treatment (surgery and loco-regional therapies, i.e hypertermic isolated limb perfusions and electrotherapy). This project aims to give the visiting scientist the basis of clinical management of patients with melanoma and soft tissue sarcoma. The research will be focused mainly on the management of patients (both surgical activities and post-operative follow up), but will include also multidisciplinary aspects of oncological care (multidisciplinary discussions, genetic consults, molecular analyses of diseases). During the research stay, the visiting researcher will gain experience in surgical oncology and in some aspects of translational research. |

**5. Department of Civil, Environmental Engineering and Architecture (DICEA)**

**Location: via Marzolo 9 – 35100 Padova (PD)**

**Scientific supervisor: Full Prof. Andrea Giordano**

| No. | Program name | Maximum number of participants | Internship period | Program details (what will young scientists learn from the program) |
|---|---|---|---|---|
| **1** | Development of operational and application methodologies for Building Information Modeling (BIM), aimed at optimizing the analysis and management processes of historical architectural and engineering heritage through advanced visualization systems | 1 | 2 months | The research purposes to use BIM to comprehensively address new challenges in the management of historic architectural and engineering assets. Specifically, the research aims to integrate advanced visualization systems from the most widely used BIM software to develop an information standard that ensures greater interoperability between formats. This will be achieved through state-of-the-art analysis in the field of BIM and the optimization of databases and object libraries related to specific historic buildings, including in relation to Scan-to-BIM operations. |

**6. Department of Civil, Environmental Engineering and Architecture (DICEA)**

**Location: via Marzolo 9 – 35100 Padova (PD)**

**Scientific supervisor: Full Prof. Valentina Salomoni**

| No. | Program name | Maximum number of participants | Internship period | Program details (what will young scientists learn from the program) |
|---|---|---|---|---|
| **1** | Innovative Material and Structural solutions for Sustainable constructions in Uzbekistan | 1 | 2 months | The proposed research programme aims to strengthen scientific collaboration between the University of Padua and Uzbek research institutions by addressing key environmental challenges currently faced by Uzbekistan, including advanced structural solutions as Light Steel Thin-Walled Structures (LSTK): LSTK in Uzbekistan frame technologies are gaining popularity due to their high seismic resilience, light structural weight, and architectural flexibility; Precast & Reinforced Concrete: high-density infrastructure solutions are to be engineered to withstand extreme Central Asian weather and seismic activity. The research project would also consider Bio-Based & Hybrid Earthen Materials, such as e.g. Straw-Clay-Wood Infill, to reduce reliance on carbon-heavy fired bricks, developers are integrating locally sourced straw, clay, and timber. |

**7. Department of Civil, Environmental Engineering and Architecture (DICEA)**

**Location: via Marzolo 9 – 35100 Padova (PD)**

**Scientific supervisor: Full Prof. Maria Cristina Lavagnolo**

| No. | Program name | Maximum number of participants | Internship period | Program details (what will young scientists learn from the program) |
|---|---|---|---|---|
| **1** | Integrated Environmental Engineering Solutions for Water Scarcity and Circular Resource Management in Uzbekistan | 1 | 2 months | The proposed research programme aims to strengthen scientific collaboration between the University of Padua and Uzbek research institutions by addressing key environmental challenges currently faced by Uzbekistan, including water scarcity, wastewater management, soil salinization, climate change adaptation, and the transition towards a circular economy. The programme will focus on the development and assessment of Nature-Based Solutions (NBS) for wastewater treatment and reuse, sustainable management of water resources under arid conditions, and resource recovery from waste and wastewater through circular economy approaches. Additional activities will include the application of environmental monitoring tools, GIS and sustainability assessment methods to support decision-making for resilient water and waste management systems. By integrating environmental engineering, circular economy principles, and innovative technologies, the programme aims to develop practical and sustainable solutions that can be adapted to the Uzbek context while fostering knowledge exchange, joint research, and future international projects between the university institutions. |

**8. Department of Medicine DIMED**

**Location: Campus Biomedico via Orus 2B – 35127 Padova (PD)**

**Scientific supervisor: Associate Prof. Giulio Ceolotto**

| No. | Program name | Maximum number of participants | Internship period | Program details (what will young scientists learn from the program) |
|---|---|---|---|---|
| **1** | Reparative Mechanisms in Coronary Microenvironment during Acute Myocardial Infarction. | 1 | 2 months | Acute myocardial infarction (AMI) remains one of the leading causes of mortality and heart failure. Despite major advances in revascularization strategies and pharmacological therapy, substantial interindividual variability persists in left ventricular functional recovery, highlighting the need for novel prognostic biomarkers and therapeutic targets. This project aims to identify cellular and molecular signatures within coronary thrombus aspirates that are associated with favorable clinical outcomes in patients with AMI. To achieve this, single-cell RNA sequencing (scRNA-seq) will be used to characterize the transcriptomic profile of individual cells, enabling the identification of distinct cellular populations, their functional states, and their biological roles. During the two-month research stay, the visiting scientist will participate in translational research activities related to this project, with a particular focus on sample processing, single-cell transcriptomic approaches, and data interpretation. |

**9. Department of Medicine DIMED**

**Location: Via Giustiniani 2, 35128 Padova**

**Scientific supervisor: Associate Prof. Andrea Visentin**

| No. | Program name | Maximum number of participants | Internship period | Program details (what will young scientists learn from the program) |
|---|---|---|---|---|
| **1** | Internship in Hematology | 1 | 2 months | Chronic lymphocytic leukemia (CLL) is the most common adult leukemia and represents a model disease for precision hematology. This program aims to provide visiting young scientists with a comprehensive understanding of the clinical and translational research aspects of CLL. The training will focus on patient management, including diagnosis, prognostic assessment, treatment selection, and response monitoring, while integrating laboratory-based research on disease biology, biomarkers, and mechanisms of treatment resistance. Participants will also attend multidisciplinary clinical discussions and gain experience in the translation of molecular and genomic discoveries into clinical practice, fostering skills in both clinical investigation and translational hematology. |