MSCA Success Stories from Organisations in Widening Countries

Host organisation: University of Rijeka, Faculty of Civil Engineering  
Country: Croatia  
Organisation role: beneficiary/ WP leader  
Project Acronym: THREAD  
Project start and end date: 01.10.2019 – 30.09.2023  
Type of MSC action, H2020: ITN

Your story:  
Project objectives and research field:  
The project will train our transnational team of early-stage researchers in a field of flexible slender structural elements in a variety of engineering applications including mechanical, structural, textile and aerospace as well as applied mathematics. In Rijeka, we plan to develop robust numerical procedures for analysis of satellite aerials in order to minimise the space needed within a rocket.

Tell us why the topic is important and/or how it brings to advancement in your research field:  
In order to eject a satellite into a stable orbiting motion around the Earth, its carrier rocket needs to attain the 1st cosmic velocity (nearly 30,000 km/h), for which a vast amount of power is needed, making each launch a very costly undertaking. While the satellite mass is an obvious parameter influencing its contribution to the total cost, the volume it occupies within the rocket is also of importance. To reduce this volume, we will numerically analyse the possibility that a satellite is packed within the rocket with its aerials bent, which should straighten without any plastic deformation or damage upon expulsion of the satellite into the orbit. To provide for this, we will develop stable and robust numerical integrators for motion of the satellite aerials both on-board, when they are highly strained and subjected to large inertial forces and high-frequency vibration in a confined space, as well as in its operational orbiting condition, when they experience large spatial rotation.

What are the benefits of participating in an MSC action?:  
MSC Innovative Training Networks are the most suitable framework for the activities our THREAD team had in mind when planning the application. There is a pressing need for a new class of young engineers and mathematicians capable of addressing
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fundamental questions related to mechanical modelling, mathematical formulations, numerical methods and various engineering applications in which flexible slender structures take place. The THREAD network leverages outstanding research in the analysis and simulation of flexible rod models and their use for virtual product design and control of a large range of problems where flexible slender structures – in some applications thousands of them – interact in a complex and multi-physical manner at multiple spatial scales. The research programme of THREAD is specifically designed to train such professionals by exposing them to the most demanding challenges in research and development across a range of diverse engineering disciplines.

Did you encounter any challenges during application/ implementation and did you get any help?

Any MSC action is challenging in its own right and ours was no different. The activities of our network started in the summer of 2016 with one unfinished and one unsuccessful application before receiving an evaluation summary report that recommended that THREAD should be financed. Our co-ordinator at the University of Halle-Wittenberg in Germany had excellent support on both national and university level and this support was available to other beneficiaries as well. The biggest challenge came quite unexpectedly in the spring of 2020 when at the most sensitive time (the planned start of employment of our early-stage researchers) Covid-19 pandemic broke out and nearly all our countries ended in a protracted lock-down. On average, this resulted in almost three months’ delay in the project activities. On the local level, the biggest support came from the Croatian NCP regarding financial management in our country, which is outside of the Eurozone. The colleagues at NTNU in Trondheim (another non-Euro THREAD beneficiary) also helped us with their experiences.

Would you recommend others to apply? What useful advice/ tips can you give them?

Writing project proposals at this level of demand is a complex, time-consuming and often frustrating activity stretching over many months, which is intellectually highly charged and demanding in terms of planning, co-ordination and support on multiple levels. Then, statistically, there is only about 10% chance of success. Still, I would highly recommend it: find compatible partners and an experienced co-ordinator, organise yourself and start working on the proposal well before your call is open. If unsuccessful, learn from reviews and improve your proposal for the next call.

What strategies did your organisation use to attract the fellow/s? Are they in line with national strategies supporting the widening EC policy?

Recruitment of THREAD early-stage researchers has been conducted almost entirely on the consortium level. Our faculty advertised the call for applications, but they were all collected by the co-ordinator and processed by the beneficiaries running the particular individual projects. Our faculty advertised the open position in a local
newspaper, on its web page and the EURAXESS jobs portal. In all, there were more than two hundred applications for the fourteen THREAD ESR positions, some of them for several individual projects, of which twenty-four for the project in Rijeka.