

Session 3

Task two: Evaluate idea fit

Task two: Where does this idea fit?

- Take 1-2 of the the following ideas and answer the following questions?
 1. Why / why not is this idea ERC material?
 2. Does it look like a starter/cons grant or an advanced grant?
 3. Which panel would you target?
 4. Do you believe this idea was funded?

20 mins for quick evaluation – then 10 mins discussion

Two-dimensional (2D) nanosheets, which possess a high degree of anisotropy with nanoscale thickness and infinite length in other dimensions, hold enormous promise as a novel class of ultrathin 2D nanomaterials with various unique functionalities and properties, and exhibit great potential in energy storage and conversion systems that are substantially different from their respective 3D bulk forms. Here I propose a strategy for the synthesis and processing of various 2D nanosheets across a broad range of inorganic, organic and polymeric materials with molecular-level or thin thickness through both the top-down exfoliation of layered materials and the bottom-up assembly of available molecular building blocks. Further, I aim to develop the synthesis of various 2D-nanosheet based composite materials with thickness of less than 100 nm and the assembly of 2D nanosheets into novel hierarchal superstructures (like aerogels, spheres, porous particles, nanotubes, multi-layer films). The structural features of these 2D nanomaterials will be controllably tailored by both the used layered precursors and processing methodologies. The consequence is that I will apply and combine defined functional components as well as assembly protocols to create novel 2D nanomaterials for specific purposes in energy storage and conversion systems. Their unique characters will include the good electrical conductivity, excellent mechanical flexibility, high surface area, high chemical stability, fast electron transport and ion diffusion etc. Applications will be mainly demonstrated for the construction of lithium ion batteries (anode and cathode), supercapacitors (symmetric and asymmetric) and fuel cells. As the key achievements, I expect to establish the delineation of reliable structure-property relationships and improved device performance of 2D nanomaterials.

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PE5 Synthetic Chemistry and Materials

Materials synthesis, structure-properties relations, functional and advanced materials, molecular architecture, organic chemistry.

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Project acronym	2DMATER
Project	Controlled Synthesis of Two-Dimensional Nanomaterials for Energy Storage and Conversion
Researcher (PI)	Xinliang Feng
Host Institution (HI)	TECHNISCHE UNIVERSITÄT DRESDEN
Call Details	Starting Grant (StG), PE5, ERC-2012-StG_20111012

The ageing population structure of most European countries has major health, economic and social consequences that lead to a need to better understand both the evolutionary limitations of deferring ageing, as well as the mechanisms involved in growing old. Ageing involves reduced fertility, mobility and ability to combat disease, but some individuals cope with growing old better than others. Improving the quality of life at old age and predicting future changes in longevity patterns of societies might depend on our ability to develop indicators of how old we really are and how many healthy years we have ahead, and how those indicators depend on our health history across several decades. Yet, most model species used in biology are short-lived and provide a poor comparison to long-lived mammals such as humans. Further, they do not often inform on the mechanisms of ageing alongside its fitness consequences in natural populations of long-lived mammals. This project integrates different ageing mechanisms with unique data on lifelong disease and reproductive history in the most long-lived non-human mammal studied so far, the Asian elephant. I will examine how different mechanisms of ageing (telomere dynamics, oxidative stress and telomerase activity) interact with lifelong disease and reproductive history, and current endocrinological measures of stress and reproductive status. This will help us to better understand both the mechanisms of ageing and their consequences on senescence rates. To do so, I will combine the most comprehensive demographic data ($N \sim 10,000$) on Asian elephants in the world with bi-monthly health assessments and disease records across life ($N \sim 2500$) and with longitudinal markers of ageing and hormonal correlates of stress and reproductive potential ($N \sim 240$). Understanding changes in health across life and its links to ageing rates, stress levels and life-history in a species as long-lived as humans will be relevant to a large range of end-users.

LS8 Ecology, Evolution and Environmental Biology

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Project acronym	Elephant Project
Project	How elephants grow old
Researcher (PI)	Virpi Annikki Lummaa
Host Institution (HI)	TURUN YLIOPISTO
Call Details	Consolidator Grant (CoG), LS8, ERC-2014-CoG

Debates over the type and degree of integration pursued by European states currently dominate the European Union (EU). As the gulf between proponents and critics of the 'Community method' grows more acute, as the EU environment increasingly revolves around interstate relations, and as scenarios of EU 'disintegration' are entertained at various levels, attention has focused on historical precedents of intergovernmental models of cooperation in the hope of foreseeing the EU's future development. Such debates have aroused notable interest in the European Free Trade Association (EFTA), the principal 'other' in postwar European politics. Yet very little is known about how and why EFTA developed in the way it did, its institutional and policy-making structure or the implications of these aspects for the present-day EU. The current state-of-the-art suffers two particular limitations: (i) it concentrates on very short time periods and (ii) it presents a highly state-centric realist account of EFTA's history. This project fills this gap by undertaking a detailed historical study of EFTA's development. It aims to (i) examine EFTA's growth over a sustained period (1958–92) and (ii) account for this evolution as a product of interplay between actors at the national, transnational and institutional levels. Methodologically, the project deploys an innovative interdisciplinary approach that embeds historical research in the multi-level governance concept borrowed from political science. Empirically, the project draws on EFTA's hitherto underexplored archives in Geneva and the national collections of its various member states. Historiographically, it promises new insights into EFTA history and reconnects the organisation's and its members' historical narrative to studies of European integration that generally focus more on the denser pre-history of the EU. In so doing, the project adds significantly to both research in the European Research Area and the priorities of Horizon 2020.

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Topic	MSCA-IF-2014-EF	Type of action	MSCA-IF-EF-ST
Call identifier	H2020-MSCA-IF-2014	Acronym	EFTA DEVELOPMENT
Proposal title	The ‘other’ Europe: the formation and development of the European Free Trade Association (EFTA), 1958–92		
<i>Note that for technical reasons, the following characters are not accepted in the Proposal Title and will be removed: < > " &</i>			
Duration in months	24		
Panel	SOC - Social Sciences and Humanities		

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