Deutsche Forschungsgemeinschaft (German Research Foundation)
Information for Researchers

Call for Proposals

No. 46 **30 July 2018**

Priority Programme "Cooperative Multilevel Multistable Micro Actuator Systems (KOMMMA)" (SPP 2206)

In March 2018, the Senate of the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) established the Priority Programme "Cooperative Multilevel Multistable Micro Actuator Systems (KOMMMA)" (SPP 2206). The programme is designed to run for six years. The present call invites proposals for the first three-year funding period.

Objectives

The ongoing miniaturisation and the increasing demands on the functionalities of microsystems generate an urgent need for innovative approaches to control, for example, mechanics, optics or fluidics on a micrometer scale. An important prerequisite is the smart coupling of distributed microactuators into a cooperative synergetic actuation system. This opens the opportunity to generate new functionalities and thereby to tackle complex actuation tasks comprising combinations of force, displacement and dynamics that have not been possible until now. To date, various microactuators have been developed and are in use; yet, their systematic coupling to cooperative multistage or, for instance, multistable microactuator systems is still outstanding. In microsystems technology, substantial developments are currently carried out in sensors and sensor systems. The coherent cooperation of different microactuators will enable innovative "smart" systems solutions building a bridge to the success of today's sensor technology.

The objectives of this interdisciplinary Priority Programme are to demonstrate new theoretically founded concepts to understand the complex coupling and synergy effects in cooperative microactuator systems as well as novel methods for the design, fabrication and control of cooperative and/or multistage microactuator systems. The development of bi-/multistable mechanisms will be required.

The research of this Priority Programme should focus on four core issues addressing different lengths and/or time scales:

(1) basic understanding of coupling effects and cross-sensitivities that arise from the spatially confined arrangement of diverse microactuators and corresponding functional materials
(2) identification and understanding of synergy effects resulting from promising combinations of microactuators, inherent sensing properties and multi-stable mechanisms
(3) design and evaluation of architectures of multifunctional actuator systems for microsystems applications
(4) methods for the fabrication and control in microsystems applications including microtechnologies, integration and functionalisation of actuator materials and supporting structures

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Organisation and Cooperation
KOMMMA brings together research groups of the different research fields of microactuators, microsystems, material science, system simulation, control and systems engineering and focusses their complementary expertise ranging from basic principles to demonstrator applications. A coordinating project will be implemented to stimulate the synergies and the networking between the projects, organise joint workshops and dissemination activities, and promote early career researchers and gender issues.

Proposal Submission
Proposals should focus on the core issues (1) and/or (2) during the first funding period and point out the route on how the core issues (3) and (4) will be addressed. Joint proposals, which include cooperation across discipline orders, will be encouraged. The number of principal investigators should reflect the complementary expertise needed for the proposed research. Proposals should aim at a comprehensive evaluation of cooperative multistage multistable microactuator systems (KOMMMA) addressing fundamental design parameters, engineering up to innovative demonstrator systems for applications in, e.g., micromechanics, -optics and -fluidics.

Proposals should not address the development of single actuators and developments exclusively on technologies, materials or simulation tools. Also, the development of any applications, e.g. robot and cyberphysical systems, will not be considered unless the proposals have a clear focus on cooperative multistage multistable microactuator systems.

Proposals for the first three-year funding period have to be submitted no later than **14 November 2018** via DFG's secured "elan" portal. Registered applicants select "Proposal Submission – New Project – Priority Programmes". General information on proposals in the framework of a Priority Programme (in particular concerning eligibilty and admissible funding requests) can be found in guideline 50.05 (part B). These forms can either be downloaded from our website or accessed through the elan portal. See also guideline 54.01 for instructions how to prepare a proposal.

Note that the descriptions of the projects and all CVs need to be prepared in English. Further, DFG's rules for publication lists (guideline 1.91) need to be respected: Beside the general bibliography, every proposal should include a list of up to ten publications by the applicant(s) (and/or members of his/her group) that relate directly to the project. Any academic CV submitted to the DFG must not listen more than ten publications which describe best the scientist's profile. Publications in these lists need to be classified as a) refereed publications (published articles and monographs; accepted articles with note of acceptance by the journal) or b) other publications (e. g.; preprints).

Applicants must be registered in elan prior to submitting a proposal to the DFG. If you have not yet registered, please note that you must do so by **30 October 2018** to submit a proposal under this call; registration requests received after this time cannot be considered. You will normally receive confirmation of your registration by the next working day. Note that you will be asked to select the appropriate Priority Programme call during both the registration and the proposal submission process.

The review colloquium for the Priority Programme will presumably take place at the Karlsruhe Institute of Technology in spring 2019.

Further Information

More information on the Priority Programme is available under:
www.spp-kommma.de

The elan system can be accessed at:
https://elan.dfg.de/en

DFG forms 1.91, 50.05, 53.01 and 54.01 can be downloaded at:
www.dfg.de/formulare/1_91
www.dfg.de/formulare/50_05
www.dfg.de/formulare/53_01_elan
www.dfg.de/formulare/54_01

For scientific enquiries please contact the Priority Programme coordinator:
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