Research IDEAS

2023 Call Document

Contents

1 Introduction

ZEISS is a global company world-wide known and recognized for high quality instrumentation and solutions for the semiconductor, automotive and mechanical engineering industries, biomedical research and medical technology, as well as eyeglass lenses, camera and cine lenses, binoculars and planetariums.

ZEISS and EPFL intend to collaborate in the field of Imaging and Digital Engineering, Application and Systems (IDEAS). To this purpose, a fund has been created to finance seed projects in fields of interest of EPFL and ZEISS.

The present document describes the focus areas and evaluation procedure of the sixth call launched through this collaboration.

2 Background and objectives

The IDEAS fund finances seed projects of typically one year in fields defined by the scientific committee (SC) with a budget of about 100 k€. The most promising projects may then be continued by a joint research project financed either by ZEISS or by other funding.

3 Focus areas

Several areas of mutual interest between Zeiss and EPFL have been identified by the SC. The present call targets a broad range of technology areas and fields as described below. The application(s) addressed should be in one or several of the following areas: medical diagnosis and visualization, life cell imaging, optical metrology and inspection, and manufacturing.

Focus Area	Focus Fields	Examples / Applications
High Quality 3D Imaging and Data Processing	• Digital imaging methods • Parallel, scalable algorithms, system architectures and efficient data formats	• Ptychographic, lightfield, tomographic and holographic imaging and processing • Superresolved 3D imaging • Hyperspectral imaging • Compressed sensing
Smart Automated Systems	• Automation technologies, miniaturized sensors, actuators and system control • Precision navigation • Machine learning, data and context interpretation	• Automated routine microscopy and metrology systems • Navigation for mobile solutions in medical visualization and inspection • Automated optimization of imaging systems
Multi-dimensional Visualization and Human-Machine Interaction	• Data representation, 3D immersion and augmentation • Real-time control and sensing, real-time processes and data processing • Human-machine interfaces • User-centered design	• Visualization systems for surgical microscopes • AR for inspection systems and support in manufacturing • 3D representation and manipulation in research microscopy

Image Simulation, Experimental Modelling and VR	• Rendering, segmentation, classification, data interpretation and information extraction • Modelling and simulation	• Systems biology • Prognostic diagnosis • Rapid prototyping of opto-electronic systems with holistic simulation
Smart, Sustainable, Nano- and Micro-Manufacturing	• Advanced concepts of additive manufacturing for novel mechatronic and micro-optical components • Integrated mechatronic/micro-optical components enabling new functionalities • Sustainable methods of large-area surface functionalization and structuring for optical components	• Quality control for advanced additive manufacturing • Coating and nano-structuring of optical surfaces to achieve specific optical, mechanical and biological functions and their combination • Integrated chips and methods for manipulation and imaging of cells and tissue

The examples and applications given aren't meant to be exhaustive with regard to problems that can be addressed in proposals.

4 Project selection process

4.1 General conditions

Preferred projects are feasibility investigations in preparation of larger long-term research projects. Although the ZEISS Fund is reserved to EPFL, the project may include external partners if needed. External partners' activity will not be funded directly by the ZEISS Fund.

The proposals should include the following elements:

- The topic proposed for the specific call.
- The expected outcomes of the Project.
- The expected timeline/duration and possible milestones.
- The estimated budget.
- The EPFL researchers and research groups involved with a clearly identified EPFL researcher as the PI and possible additional external partners, if any.

4.2 Project selection criteria

Applications will be evaluated based on the following criteria:

- Fit to the call topics.
- Scientific quality.
- Relevance of problem for application.
- Prospect of proposal (realistic plan, likelihood of collaboration and potential follow-up).

4.3 Schedule

The submission process following the Calls for Proposals will be a one-step process that may include an exchange between the principal investigator (PI) and the scientific committee (SC):

1) Submission of proposals using a dedicated short template. The proposals will then be discussed during a meeting of the Scientific Committee.

2) If required and decided, a member of the SC will contact the PI for further input and clarification before the final selection of projects for funding by the SC.

Once the winning proposal(s) has(ve) been selected by the Scientific Committee, a specific contract according to the Framework Agreement will be prepared for approval by both Parties.

The following schedule is planned for the fifth call:

Dates	Action	Who
02.10.2023	Launch	
15.11.2023	Deadline for the submission of proposals	PIs
11.12.2023	Information on decisions by the Scientific Committee	SC

5 Budget

Each selected projects will be financed according to the accepted financial plan, which should target an amount of 100 K€ for a typical period of 12 months.

6 Organization and governance

6.1 Members of the scientific committee

The SC consists of representatives of EPFL and Zeiss:

For ZEISS:
Dr. Michael Kempe (Chair)
Ralf Wolleschensky
Dr. Christoph Hauger
Dr. Michael Totzeck

For EPFL:
Prof. Yves Bellouard (Co-Chair)
Prof. Negar Kiyavash
Prof. Babak Falsafi
Dr. Robert Giezendanner-Thoben

6.2 Role of the scientific committee

The role of the SC is to:

- Launch the Call for Proposals, typically once a year.

- Evaluate, suggest changes to and select the projects to be funded by ZEISS.
- Define the appropriate type of agreement in accordance with ZEISS and the laboratory/ies and TTO of EPFL.
- Follow-up the research results and advice for potential continuation.