Call for

QPhoton Junior Research Groups

This call is part of the Carl-Zeiss-Stiftung Center for Quantum Photonics Jena-Stuttgart-Ulm, funded by the Carl-Zeiss-Stiftung under the project ID P2021-00-019.

QPhoton Junior Research Groups

Eligibility	The call is open to postdocs at an early stage in their research careers that is up to five years after completion of the doctorate. Exceptions from this rule are possible, if well justified in the individual case.
Scope	Establishing two new *Junior Research Groups* at IQST and ACP (one in Jena, one in Ulm) focusing on developing application-oriented technologies in the fields of quantum sensing, quantum imaging, and quantum information.
Funding	Per junior research group max. 700,000 EUR and for full five years. The new group leader can use these funds flexible, e.g. for his/her own position, PhD students, investments, and consumables.
Start	In 2024, as early as possible after the call selection.
Proposal	6 pages max. to be sent to office@qphoton.de
Deadline (2nd call)	**30.06.2024 extended until 31.07.2024**
Selection process	The decision is made by the QPhoton Executive Board and will be based on the additional expertise of external referees.
Contact	For further information feel free to contact the QPhoton directors Tilman Pfau (Stuttgart), Joachim Ankerhold (Ulm), or Andreas Tünnermann (Jena).

Vision

The vision of QPhoton is to establish a comprehensive and sustainable scientific, intellectual and infrastructural foundation for advanced quantum imaging and information processing, including optimized imaging and sensing techniques to monitor and control quantum systems, the application of quantum technologies to develop quantum-enhanced imaging methods, and the development and deployment of sophisticated methods to control and distribute quantum information.

Goal of the Junior Research Groups

The QPhoton *Junior Research Group* is a joint, cross-location early-career scientist program and has a clear topical focus on the key research fields of CZS QPhoton defined in three innovation areas as listed below. The candidates are expected to engage in further extramural funding schemes such as Emmy Noether, ERC Starting Grants or similar funding programs. Thus, the CZS Center QPhoton

money acts as seed money to foster the researchers' academic career and build up a CZS *Junior Research Group*. On the mid-term, each QPhoton *Junior Research Group* should ideally lead to joint publication record among the three locations Jena-Stuttgart-Ulm.

Research areas of the Junior Research Groups

Two *Junior Research Groups* are announced within the following cross-location **Innovation Areas**. Each proposal should be in accordance with at least one of the following three Innovation Areas that represent exemplary fields. However, the research addressed need not be exclusively for them:

- Innovation Area 1 (only Ulm): Sensing technology to control quantum systems
  …including application-oriented (nonlinear) imaging techniques for quantum sensing, quantum simulators and quantum computers.
- Innovation Area 2 (only Ulm): Information processing for quantum technology
  …including quantum information and advanced information processing methods for data analysis and quantum-based network architectures.
- Innovation Area 3 (only Jena): Photonic systems for quantum control and information processing
  …including holistic photonic system design and integration.

Type of support

The funds requested for a *Junior Research Group* should be reasonably justified in the project proposal. Each of the two QPhoton *Junior Research Groups* receives up to 700,000 EUR funding from the host institution for a funding period of full five years. The funding can be used very flexible, either to cover staff salaries (including the group leaders' own position), consumables and investments. In addition, the junior research group will be given access to lab and office space as well as equipment, which will be fixed in a host letter upon the final appointment.

Selection criteria

QPhoton *Junior Research Groups* are designed for talented early-career scientists who have already documented their potential for excellent science by an outstanding quality of their Doctorate/PhD research in optics and photonics. We are looking both for theory and experimentally oriented early-career scientists. Furthermore, all candidates should demonstrate the ability to supervise students and their leadership potential to run a research team. A successful postdoc period is highly appreciated. Knowledge of German is an advantage, but due to the international character of the center not strictly necessary. Further selection criteria are:

- Scientific excellence of the candidate with regard to at least one of the above-mentioned Innovation Areas

- Potential of competitiveness of the candidate for national and international funding schemes like Emmy Noether, ERC Starting grant, etc. in the quantum sciences and technologies
- Originality of the proposed research project in line with the strategic research goals of CZS QPhoton
- Feasibility of the project goals (e.g. joint publication perspective)
- Credible expression of willingness of collaboration with the other locations (Jena, Stuttgart, Ulm)

Application details

Besides the standard documents, applications should include the contact details of three referees supporting the application, a filled-in application form (download at www.qphoton.de), and a detailed description of the proposed research program **(6-pages maximum)** indicating also the networking and contribution to the goals and Innovation Areas of the CZS QPhoton, the earliest starting date, and a short statement concerning reasonable co-funding of the project by the applicants own resources.

Each application should be sent in one single PDF-file to office@qphoton.de. The application **deadline is June 30, 2024** (**extended until 31.07.2024)**

Review and selection process

To guarantee for a high scientific level, a jury composed of independent, external referees will be commissioned by the QPhoton Executive Board. These external referees will pre-select a short-list of the submitted project proposals and peer-review these proposals. The referees will report to the QPhoton Executive Board and formulate a selection recommendation. The QPhoton Executive Board will take the final decision, taking strong account of the external recommendation.

After a positive decision, the project should be started 6 months after approval at the latest.

Jena/Stuttgart/Ulm, April 2024

Prof. Tilman Pfau	Prof. Joachim Ankerhold	Prof. Andreas Tünnerman
Executive director QPhoton	Co-director QPhoton	Co-director QPhoton