

# PhD

## Generation of photon triplets via three photon parametric down conversion

### Goal

First Demonstration of photon triplet state in the optical frequency domain.

### Context

In this race towards the first demonstration of triplets, we have already studied several systems, including gas-filled hollow-core photonic crystal fibers, hybrid microstructured fibers and sub-micron tapered fibers. Here we will explore the case of third order spontaneous down conversion in optical fibres.

### Requirements



The candidate **MUST** have a very good theoretical and experimental understanding in the following topics

- **Electromagnetism**
- **Optical fibers**
- **Quantum optics**
- **Nonlinear optics**

### Additional skills desired

- **Python / Matlab / C++**
- **Handling lasers**

Duration of the project: 3 years

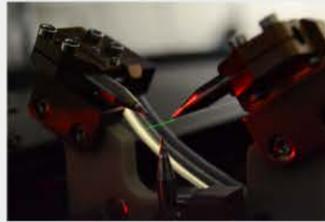
## Research highlights

Nonclassical (quantum) light generation



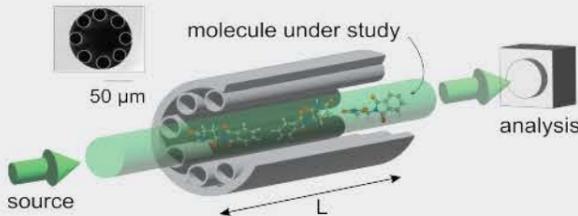
Science, **376**:621–624 (2022)

Engineering optical fibres



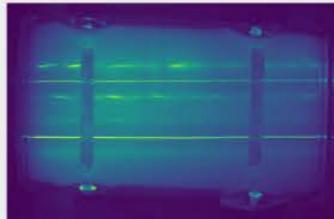
Phys. Rev. A, **101**:033840 (2020)

In-situ monitoring of chemical reactions



ACS Catalysis, **11**:6709 (2021)

Rydberg physics in fibres



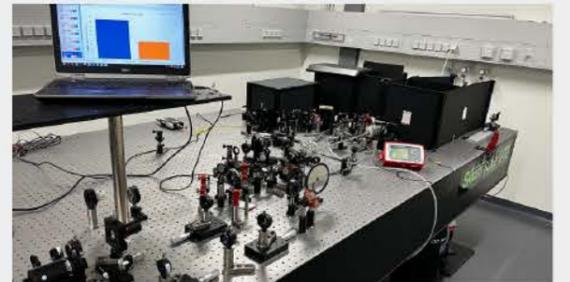
Nat. Comm., **5**:4132, 2014  
New J. Phys. **24**:113017, 2022

## Laboratories

RegA lab at the Max Planck Institute



Optical lab at the University



## Life in Erlangen



MPL is amongst the leading institutes for research in photonics around the world.

With an excellent connectivity with all major European cities, Erlangen is also home to numerous branch offices of Siemens, Adidas, Puma, Schäffler, DATEV and Bosch, thus making it cosmopolitan.

## Application procedure

Interested candidates should submit a personal statement, a full CV (including full details of all University course grades to date and contact details for at least two academic referees) and a copy of up to date transcripts to Prof Nicolas Joly.  
[nicolas.joly@mpl.mpg.de](mailto:nicolas.joly@mpl.mpg.de)



**FAU** Friedrich-Alexander-Universität  
Erlangen-Nürnberg



**MPL**  
Max Planck Institute  
for the science of light