

**Faculté de Santé****Department : Institut de la Vision, Photonics Department**  
**Location : 17 Rue Moreau, 75012 Paris, France****Job Identification****Discipline : Interconnexion between viral microbiome and immunity****Corresponding CNU sections :****30 - Milieux dilués et optique****63 - Génie électrique, électronique, photonique et systèmes**

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**Job title: Tenure track****Duration of the contract : 3 years****Quotity : 100 %****The minimum monthly remuneration is fixed by decree at 3,443.50 euros gross****Etat du poste : open****Profil**

Au sein de l'Institut de la Vision, un des leaders mondiaux dans l'étude des mécanismes et pathologies de la vision, le département de Photonique s'attache à développer des techniques qui contribueront aux outils de caractérisation biologique et diagnostiques de demain. L'équipe "Microscopies 3D" comprend 3 (enseignants-)chercheurs permanents et est installée à l'Institut de la Vision depuis 2017.

Le professeur Junior, physicien de formation avec une expérience forte en optique instrumentale, optique physique et microscopie, développera des activités de recherche de haut niveau pour le développement d'outils sensibles, spécifiques et sans marquage permettant l'imagerie ou la détection 3D d'objets biologiques ou artificiels. A court ou moyen terme, les applications visées seront en lien avec les thématiques biologiques et cliniques de l'Institut de la Vision.

**Job Profile**

The Vision Institutes is among the world leaders in the study of the mechanisms and pathologies of human vision. The Photonics department focuses on the development of techniques which will contribute to next-generation-tools for biological and clinical studies. The 3D microscopies team comprises 3 permanent researchers who joined the Institut de la Vision in 2017.

The successful Junior Professor should be a physicist with a strong experience in instrumental optics, physical optics, and microscopy. He/she will develop sensitive and specific label-free tools for the 3D detection of biological and artificial objects which will target, either in the short or medium term, applications relevant to the biological and clinical research fields of the Institut de la Vision.

**Education**

The Junior Professor should be able to teach general physics at Sorbonne Université at various levels, from L1 to M2. While the position mostly focuses on optics, microscopy and imaging, the ability to teach a broad range of specialties in physics will be appreciated, particularly at the L 1 to L3 levels. These will include e.g. optics, waves, electromagnetism, but mechanical physics, quantum physics, or electronics are also possible. The successful candidate will also be allowed to focus his teaching at higher levels (M1, M2) on subjects related to his/her field of research, e.g. optical microscopy or biophysics. Ultimately, the successful professor is expected to take a leading position and some responsibilities in the organization of teaching at Sorbonne Université. The ability to teach in French, either initially or after a short training period, will be particularly appreciated.

### Research

Institut de la Vision focuses on the study of the mechanisms and pathologies of human vision. In this context, the 3D microscopies team develops instruments aimed at providing clinicians and biologists with new insights into the eye, the brain and, more broadly, biological phenomena. Upstream from such applications, the Junior Professor will develop optics- and physics-based tools which will advance knowledge in both physics and biology.

The activities of the 3D microscopies team are centred on the development of tools to measure and shape wavefronts in order to propose new contrast modes and approaches for optical microscopy, starting with relatively fundamental physics (e.g. optics of complex media, speckle physics) to develop conceptually advanced but instrumentally simple techniques. We built up on a strong background in photothermal techniques and digital holography, which we gradually adapted to the detection of small particles biological problems.

This has notably led to the development of phase sensitive techniques including holography, Quantitative Phase Imaging (using gratings, diffusers, or other phase masks), interference Scattering microscop(iScat), and other interference-based high-sensitivity, label-free techniques, applied to the detection of ultra-small entities including artificial nanoparticles (e.g. metallic, magnetic) and biological objects (vesicles, AAV and their payload) to efficiently address biological imaging in vitro (entire or disassembled organoids, microfluidic sorting) or in small animals (optogenetics, calcium/voltage imaging, retinal imaging).

In the field of photothermal sciences, the team has developed endoscopic temperature probes for in vivo measurements, particularly to monitor optogenetics-induced heating. In this respect, collaboration with optogenetics specialists within the Photonics Department of Institut de la Vision is encouraged. In addition, electro-thermo-optical wavefront manipulation systems developed in this team (SmartLenses) allow local modifications of the temperature, and of the refractive index through thermo-optical effects. Single-lens applications (for e.g. endoscopy) or multiple lenses (for e.g. multiplane/adaptive surface imaging), are being developed with both application types targeting biological or clinical imaging.

The successful candidate should be able to propose and contribute to the development, or the diversification of one or several of these lines by proposing a high-level research project. He/she will ideally propose new instrumental concepts and applications, and bring along a network of national/international collaborators.

Results and achievements obtained in the context of the CPJ will result in publication in international journals and will be presented at international conferences and congresses. In the context of clinical or biological applications, and more broadly in the field of imaging, the research results are expected to generate intellectual property, industrial valorization and clinical applications.

He/she will be encouraged to interact with researchers at the Institut de la Vision, Sorbonne Université and partner laboratories. He/she will promote the discipline, the laboratory and the University by participating in international conferences and workshops. The recruited junior professor will be strongly encouraged to apply to French (ANR, IUF,...) and European fundings (ERC). Some experience in grant application writing (e.g. postdoc or equipment funding) is not a prerequisite but will be appreciated. The successful candidate is also expected to supervise students at various levels, from M2 interns to PhDs and postdoctoral students.

He/she will contribute to the visibility and collaboration network of the team and the institute with his/her network of national and international collaborations.

Laboratory	Sigle (UMR, UMRS, etc.)	N°
Institut de la Vision	UMR	UMR_S968 Inserm / UM 80 Sorbonne Université / UMR 7210 CNRS

### Application procedure

Applications are open from July 4<sup>th</sup> - 10:00 am (Paris time) to August 4<sup>th</sup> 2024 - 4:00 pm (Paris time). Applications must be submitted on the [Galaxie](#) website. Candidates who do not have access to this Galaxie application (in particular non-French candidates) may exceptionally submit the complete application electronically according to the established schedule and procedures. Send the application files to [pascale.bechu@sorbonne-universite.fr](mailto:pascale.bechu@sorbonne-universite.fr) ) with the subject "Candidature CPJ".

The documents to be attached to the application file are set by the [decree of February 6, 2023](#), as amended, concerning the general terms and conditions for the transfer, secondment and recruitment by competition of lecturers, university professors and junior professors (see in particular Title III - articles 24 to 27 and Title IV - articles 28 to 31).

Candidates who do not hold a doctorate must have their university diplomas, qualifications and titles recognized as equivalent to a doctorate, in accordance with one of the procedures provided for in article 5 of decree no. 2021-1710 of December 17, 2021 concerning the junior professorship contract provided for in article L. 952-6-2 of the Education Code and article L. 422-3 of the Research Code. Any incomplete application by the above-mentioned deadline will be declared inadmissible.

Only candidates who have been selected by the selection committee based on their applications will be invited to an interview, according to a timetable and procedures that will be communicated shortly.

Professional simulation : No  
Operating methods : N/A

The aforementioned [decree n° 2021-1710 of December 17, 2021](#) determines the conditions of renewal of the contract, the modalities of assessment, before the tenure, of the scientific value and the aptitude to carry out the missions of each body, the modalities of appointment of the members of the selection and tenure commissions and the conditions of the commitment to serve.

### Contacts

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