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# SPHINX: Structure Probing by Holographic Imaging at Nanometer scale with X-ray lasers

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The project aims creating ultrafast X-ray holographic cameras able to record 3D images of microscopic samples and of their internal parts with nanometer resolution. The proposal is based on a new implementation of phase-contrast holography. As practical solution, a combination of polycapillary lenses, X-Ray CCD arrays and XFEL sources enables focusing, magnification and phase contrast imaging, in the keV energy range. This reduces the diffraction limit and the characteristic angles, both crucial for the resolving power, while eliminating the shielding effect and giving access to full structure probing. The key parameters are defined by the focusing optics. The femtosecond exposure time allows holographic reconstruction of in vivo cell elements, viruses and nano-robotic devices also during ultrafast molecular processes, yet unexplored by imaging techniques.

## Summary

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