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Investigating Charge Density Waves with Resonant Scattering

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High-Tc superconductors represent one of the most intriguing challenges of condensed matter physics. Over the years, plenty of effort has been devoted to address two fundamental questions: What is the microscopic mechanism for superconductivity and how can the superconducting transition temperature be elevated?

Although these questions remain still unanswered, it has been revealed that in several unconventional superconductors the superconducting phase co-exists and sometimes competes with other types of order like charge density waves (CDW), nematic order and several forms of magnetic order.

Consequently, a possible way to optimize superconductivity could arise from tuning the relationship between superconductivity and other existing ordered phases. To be able to accomplish this, identifying and understanding ordered phases in unconventional superconductors is essential.

In this talk it will be presented how over the last decade Resonant X-ray Scattering has emerged as a unique tool to investigate CDW and more precisely how the new generation of Resonant Inelastic X-Ray Scattering (RIXS) beamlines have contributed to these studies.

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