



ARPES station for out-of-equilibrium band mapping of correlated materials

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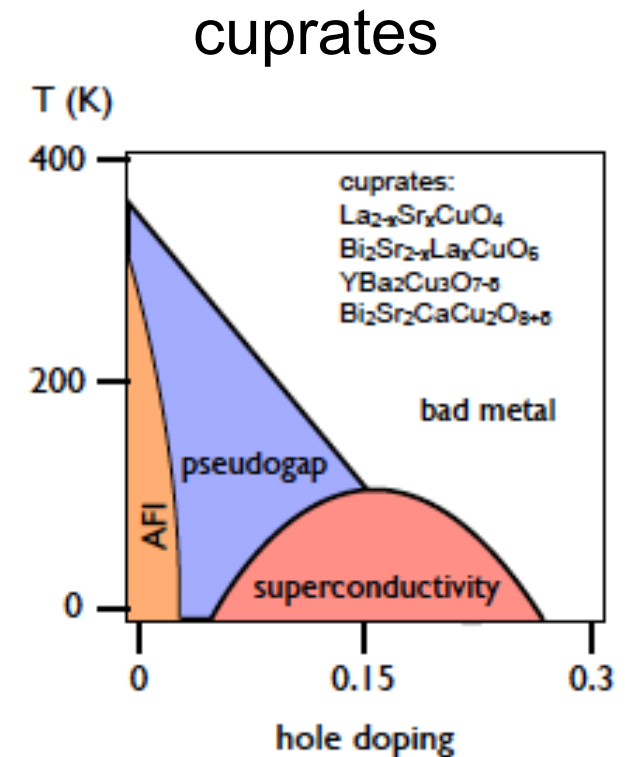
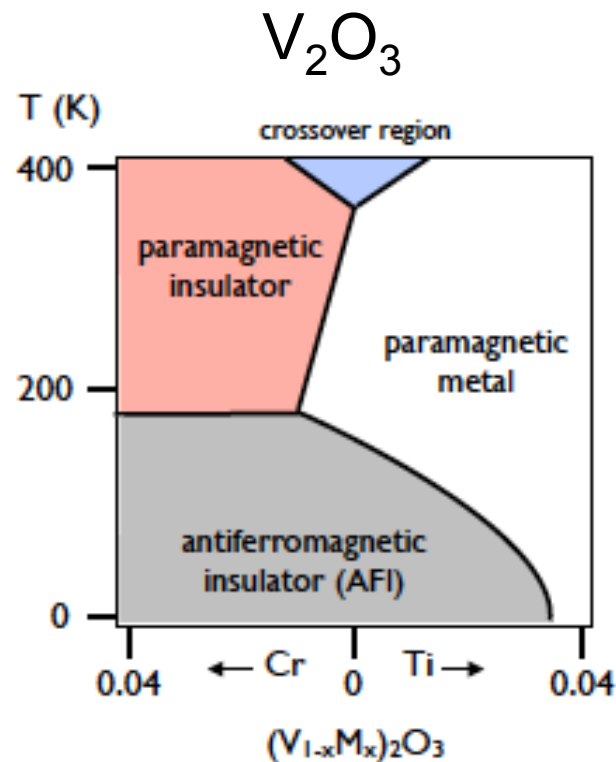
Transient states of matter \Leftrightarrow e correlations

- Out of equilibrium strongly correlated materials
- Time Resolved ARPES : time evolution of the electronic structure
- Metal-insulator transitions: electron correlations \Leftrightarrow lattice distortion
- fs laser pulses \Leftrightarrow (transiently) decouple electrons from lattice
- drive one term out of equilibrium and follow the reaction of the other
- Theoretical modeling of the transient Mott insulator / correlated metal

Why (out-of-equilibrium) correlated materials

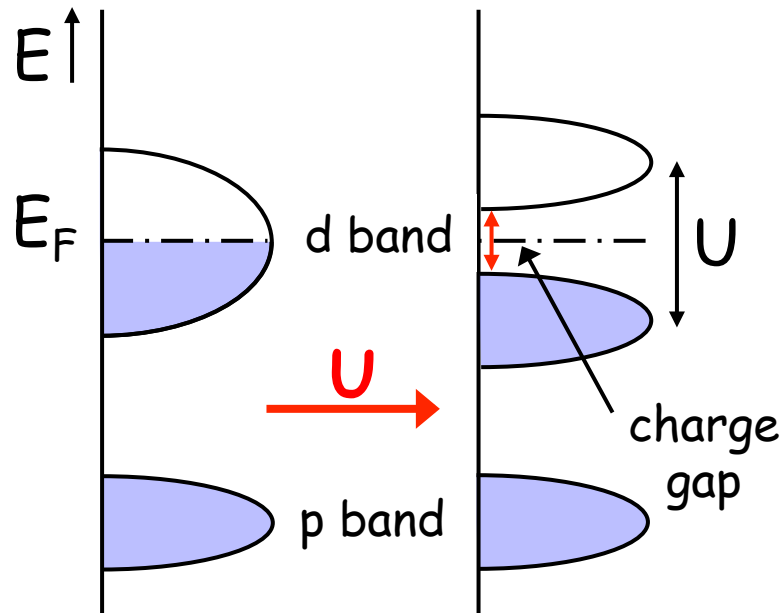
- Strongly correlated oxides \Leftrightarrow phase transitions
- Metal – insulator Transitions (Mott-Hubbard compounds)
- High temperature (T_c) superconductors (cuprates)

One can dramatically change the number of carriers



Mott insulators

Correlation-induced metal to insulator transition (MIT) in strongly correlated materials :



Competition { Kinetic energy (t)
 e^-e^- interaction (U)

- no change in the crystal structure
- no change in the long range magnetic order



Other effects can contribute to stabilizing the Mott phase

(ex: AF order in cuprates)

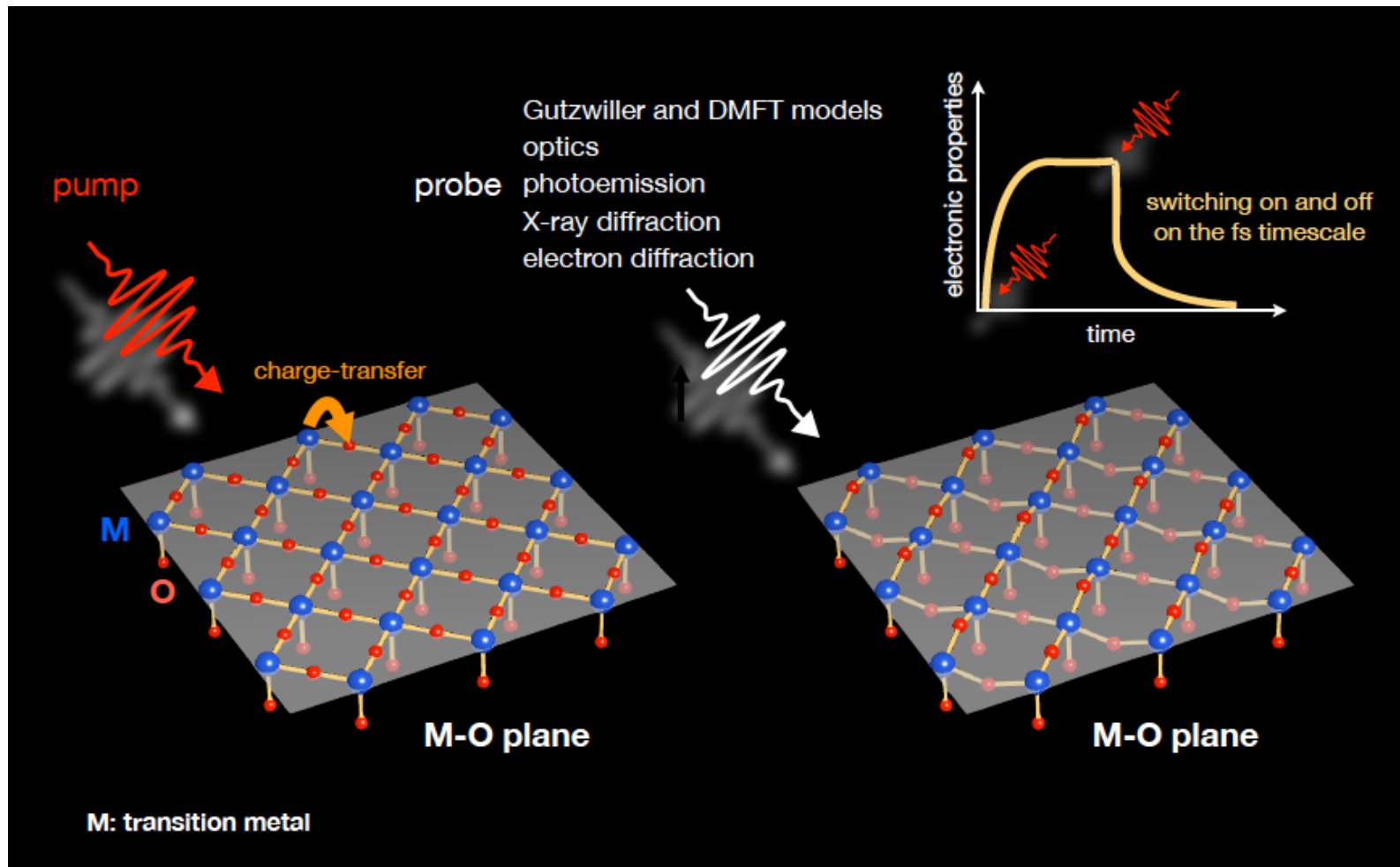
(ex: structural distortion VO_2)

Transient states of matter \leftrightarrow e correlations

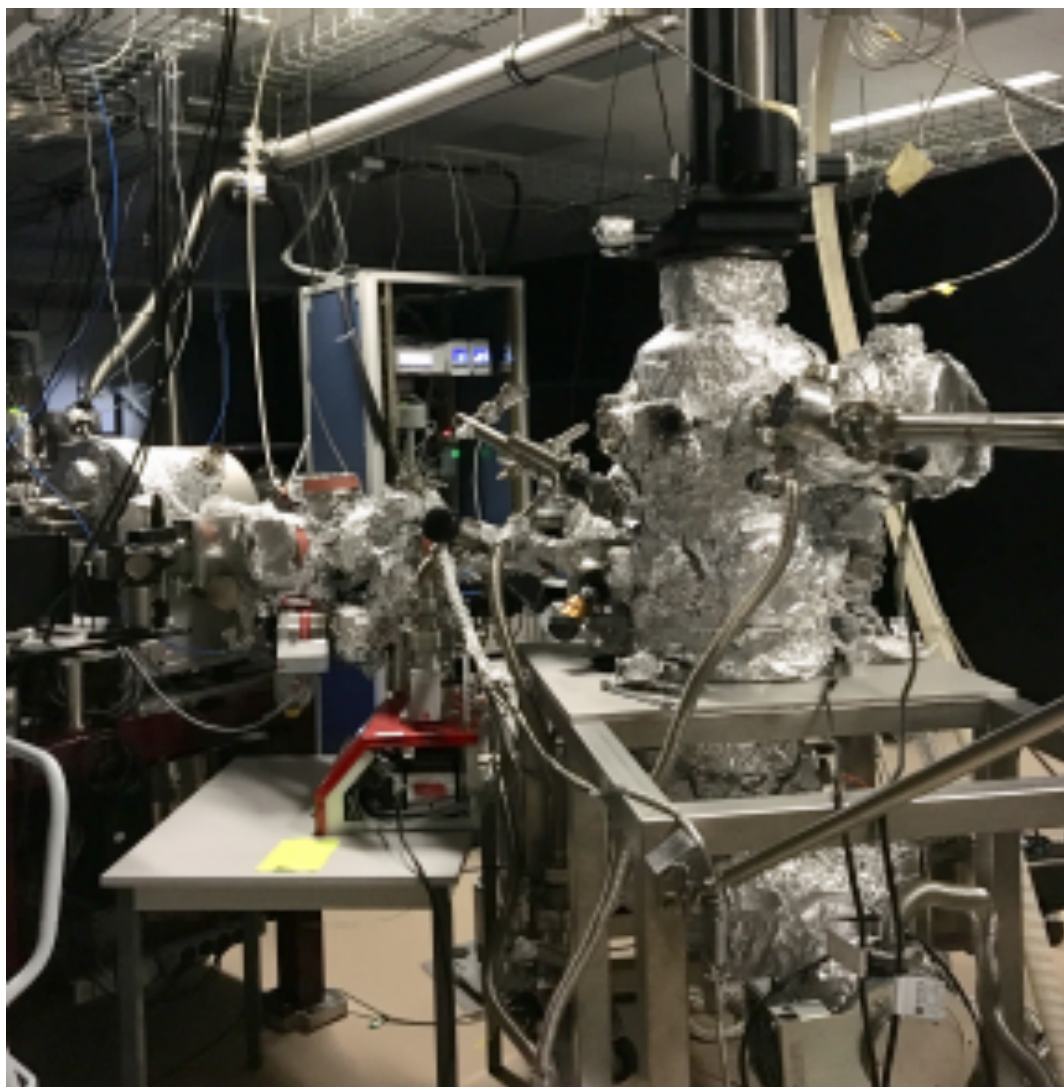
→ Photoinducing phase transitions

→ time > 100 fs lattice distortions

→ fs and shorter \leftrightarrow e-e correlations



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