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7.2 Making ultracold polar molecules7.3 Characterizing the ultracold polar molecules; 7.4 Ultracold chemistry, dipolar interactions, and reduced dimensionality; Acknowledgements; References; 8 Ultracold Fermi gases as quantum simulators of condensed matter physics; 8.1 Introduction; 8.2 The non-interacting Fermi gas; 8.3 Fermionic super. uidity and the BEC-BCS crossover; 8.4 Probing the fermionic superfluid; 8.5 Conclusion; References; 9 Competing instabilities in quench experiments with ultracold Fermi gases near a Feshbach resonance; 9.1 Overview; 9.2 Introduction
9.3 Linear response and collective modes9.4 Feshbach resonance via pseudo-potentials; 9.5 Application to pairing susceptibility; 9.6 More on Stoner instability; 9.7 Discussion; 9.8 Concluding remarks; Acknowledgements; References; 10 Anderson localization of ultracold atoms in a laser speckle; 10.1 Anderson localization for the beginner; 10.2 Ultracold atoms in optical speckle: a good candidate for the observation of Anderson localization; 10.3 One-dimensional Anderson localization?; 10.4 Direct observation of Anderson localized 1D wavefunctions
10.5 What happens beyond the 1D effective mobility edge?

Sommario/riassunto

This title provides authoritative tutorials on the most recent achievements in the field of quantum gases at the interface between atomic physics and quantum optics, condensed matter physics, nuclear and high-energy physics, non-linear physics and quantum information.