

Selected Publications

2019

1. Quantum oscillations between two weakly coupled reservoirs of superfluid ^3He S.V. Pereverzev, A. Loshak, S. Backhaus, J.C. Davis and R.E. Packard, [*Nature* **388**, 449 \(1997\)](#).
2. Direct measurement of the current-phase relationship of a superfluid ^3He weak link, Backhaus S., Pereverzev S.V., Davis J.C., and Packard R.E., [*Science* **278**, 1435-1438 \(1997\)](#).
3. Discovery of a metastable $\square\square$ -state in superfluid ^3He weak link, S. Backhaus, R. Simmonds, S. Pereverzev, A. Loshak, J.C. Davis R.E. Packard [*Nature* **392**, 687-690 \(1998\)](#).
4. Observation of Third Sound in Superfluid ^3He A.M. R Schechter, R.W. Simmonds, R.E. Packard, and J.C. Davis, [*Nature* **396**, 554-557 \(1998\)](#).
5. Josephson effect and a p-state in superfluid ^3He , S. Backhaus, R. W. Simmonds, A. Loshak, J. C. Davis & R. E. Packard, [*Nature* **397**, 485 \(1999\)](#)
6. Atonic-sacle Quasi-Particle Scattering Resonances in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$, E.W. Hudson, S. H. Pan, A. K. Gupta, K-W Ng, and J.C. Davis, [*Science* **285**, 88 \(1999\)](#)
7. Imaging the Effects of Individual Zinc Impurity Atoms on Superconductivity in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$, S.H. Pan, E.W. Hudson, K.M. Lang, H. Eisaki, S. Uchida, and J.C. Davis, [*Nature* **403**, 746 \(2000\)](#)
8. Interplay of magnetism and high- T_c superconductivity at individual magnetic impurity atoms in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+}$ Hudson, E.W., Lang, K, Madhavan, V., Pan, S.H., Eisaki, H., Uchida, S. & Davis, J.C. [*Nature* **411** 920 \(2001\)](#).
9. Quantum Interference of Superfluid ^3He , R. W. Simmonds, A. Marchenkov, J. C. Davis and R.E. Packard, [*Nature* **412** 55 \(2001\)](#).
10. Microscopic electronic inhomogeneity in the high-temperature superconductor $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ S. H. Pan, J. O'Neil, R.L. Badzey, H. Ding, Z. Wang, H. Esiaki, S. Uchida, A. Gupta. K-W Ng, E. W. Hudson K.M. Lang and J. C. Davis, [*Nature* **413** 282 \(2001\)](#).
11. Imaging the granular structure of high- T_c superconductivity in underdoped $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$, K. M. Lang, V. Madhavan, J. Hoffman, E.W. Hudson, H. Eisaki, S. Uchida, and J.C. Davis, [*Nature* **415**, 412 \(2002\)](#).
12. A four unit cell periodic pattern of quasiparticle states surrounding vortex cores in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ J. E. Hoffman, E.W. Hudson, K. Lang, V. Madhavan, H. Eisaki, S. Uchida, and J.C. Davis, [*Science* **266**,455 \(2002\)](#).
13. Imaging Quasiparticle Interference in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ J. Hoffman, K. McElroy, D-H Lee, K.M. Lang, H Eisaki, S. Uchida, and J. C. Davis, [*Science* **297**, 1148 \(2002\)](#).
14. Relating atomic scale electronic phenomena to wave-like quasiparticle states in superconducting $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ K. McElroy, R. W. Simmonds, J. E. Hoffman, D.-H. Lee, J. Orenstein, H. Eisaki, S. Uchida & J.C. Davis, [*Nature* **422**, 520 \(2003\)](#).
15. A 'checkerboard' electronic crystal state in Lightly Hole-Doped $\text{Ca}_{2-x}\text{Na}_x\text{CuO}_2\text{Cl}_2$ Tetsuo Hanaguri, C. Lupien, Y. Kohsaka, D.-H. Lee, M. Takano, H. Takagi, & J. C. Seamus Davis. [*Nature* **430**, 1001 \(2004\)](#).
16. Atomic-scale Sources and Mechanism of Nanoscale Electronic Disorder in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ Kyle McElroy, Jinho Lee, James Slezak, D.-H. Lee, H. Eisaki, S. Uchida, J.C. Seamus Davis. [*Science* **309**, 1048 \(2005\)](#).
17. Interplay of electron-lattice interactions and superconductivity in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ Jinho Lee, K. Fujita, K. McElroy, J.A. Slezak, M. Wang, Y. Aiura, H. Bando, M. Ishikado, T. Masui, J. -X. Zhu, A. V. Balatsky, H. Eisaki, S. Uchida, and J. C. Davis, [*Nature* **442**, 546 \(2006\)](#).
18. The Ground State of Pseudogap in Cuprates: $\text{La}_{1.875}\text{Ba}_{0.125}\text{CuO}_4$, T. Valla, A. V. Fedorov, J. C. Davis, Jinho Lee, and G. D. Gu, [*Science* **314**, 1914 \(2006\)](#).

19. An intrinsic bond-centered electronic glass with disperse unidirectional domains in underdoped cuprates, Y. Kohsaka, C. Taylor, A. Schmidt, K. Fujita, C. Lupien, T. Hanguri, H. Eisaki, S. Uchida, H. Takagi and J. C. Davis, [*Science* **315**, 1380 \(2007\)](#).
20. How Cooper pairs vanish approaching the Mott insulator in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ Y. Kohsaka, C. Taylor, P. Wahl, A. Schmidt, Jinhwan Lee, K. Fujita, J. Alldredge, Jinho Lee, K. McElroy, H. Eisaki, S. Uchida, D.-H. Lee, & J.C. Davis, [*Nature* **454**, 1072 \(2008\)](#).
21. Evidence for a ‘Superglass’ State in Solid ^4He , B. Hunt, E. Pratt, V. Gadagkar, M. Yamashita, A. V. Balatsky & J.C. Davis, [*Science* **324**, 632 \(2009\)](#).
22. Spectroscopic Fingerprint of Phase Incoherent d-Wave Superconductivity in the Cuprate Pseudogap State, Jinhwan Lee, K. Fujita, C.K. Kim, A. Schmidt, H. Eisaki, S. Uchida, & J.C. Davis, [*Science* **325**, 1099 \(2009\)](#).
23. Nematic Electronic Structure in the ‘Parent’ State of Iron-based Superconductor $\text{Ca}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$, T.-M. Chuang, M.P. Allan, J. Lee, Ni Ni, S. Bud’ko, G. Boebinger, P.C. Canfield & J.C. Davis, [*Science* **327**, 181 \(2010\)](#).
24. Imaging the Fano Lattice to Hidden Order transition in URu_2Si_2 , A.R. Schmidt, M. H. Hamidian, P. Wahl, F. Meier, A. Balatsky, T. Williams, G.M. Luke and J.C. Seamus Davis, [*Nature* **465**, 570 \(2010\)](#).
25. Intra-unit-cell Electronic Nematicity of the High- T_c Cuprate Pseudogap States, M. J. Lawler, K. Fujita, Jinhwan Lee, A.R. Schmidt, Y. Kohsaka, Chung Koo Kim, H. Eisaki, S. Uchida, J.C. Davis, J.P. Sethna, and Eun-Ah Kim, [*Nature* **466**, 374 \(2010\)](#).
26. Interplay of Rotational, Relaxational, and Shear Dynamics in Solid ^4He , E.J. Pratt, B. Hunt, V. Gadagkar, M. Yamashita, M. J. Graf, A. V. Balatsky and J.C. Davis, [*Science* **332** 821, \(2011\)](#).
27. Topological Defects Coupling Smectic Modulation to Intra-Unit-Cell Nematicity in Cuprates A. Mesaros, K. Fujita, H. Eisaki, S.I. Uchida, J.C. Seamus Davis, Subir Sachdev, Jan Zaanen, M.J. Lawler and Eun-Ah Kim, [*Science* **333**, 426 \(2011\)](#).
28. Anisotropic Energy-Gaps of Iron-based Superconductivity from Intra-band Quasiparticle Interference in LiFeAs M. P. Allan, A. W. Rost, A. P. Mackenzie, Yang Xie, J. C. Davis, K. Kihou, H. Eisaki, and T.-M. Chuang, [*Science* **336**, 563, \(2012\)](#).
29. Simultaneous Transitions in Cuprate Momentum-Space Topology and Electronic Symmetry Breaking. K. Fujita, C.K. Kim, Inhee Lee, Jinho Lee, M. H. Hamidian, I. Firmo, H. Eisaki, S. Uchida, M.J. Lawler, E.-A. Kim, and J.C. Davis. [*Science* **344**, 612 \(2014\)](#).
30. Detection of a Cooper-Pair Density Wave in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$, M. Hamidian S. D. Edkins, Sang Hyun Joo, A. Kostin, H. Eisaki, S. Uchida, M. J. Lawler, E. -A. Kim, A. P. MacKenzie, K. Fujita, Jinho Lee, J. C. Séamus Davis, [*Nature* **532**, 343 \(2016\)](#)
31. Discovery of Orbital-Selective Cooper Pairing in FeSe , P.O Sprau, A. Kostin, A. Kreisel, A. E. Böhmer, V. Taufour, P.C. Canfield, S. Mukherjee, P.J. Hirschfeld, B.M. Andersen, J. C. Séamus Davis, [*Science* **357**, 75 \(2017\)](#).
32. Magnetic-field Induced Pair Density Wave State in the Cuprate Vortex Halo. S.D. Edkins, A. Kostin, K. Fujita, A. P. Mackenzie, H. Eisaki, S. Uchida, M. J. Lawler, E-A. Kim, S. A. Kivelson, J.C. Séamus Davis, and M. H. Hamidian, to appear [*Science* \(2019\)](#)
33. Using Machine Learning for Scientific Discovery in Electronic Quantum Matter Visualization Experiments Yi Zhang, A. Mesaros, K. Fujita, S.D. Edkins, M.H. Hamidian, K. Ch'ng, J.C. Séamus Davis, E. Khatami and Eun-Ah Kim, to appear [*Nature* \(2019\)](#).