

# Condensed Matter Physics in the City 2018

## week 1: 11 - 14 June

**Monday 11 June** 11 Bedford Square, Room 1-01, London, WC1B 3RF

09:45 - 10:00 Coffee/Tea  
10:00 - 10:45 **John Saunders** (Royal Holloway, University of London), Superconductivity in  $\text{YbRh}_2\text{Si}_2$   
10:45 - 11:15 Discussion  
11:15 - 11:30 Coffee/Tea and discussions  
11:30 - 12:15 **Premi Chandra** (Rutgers University), Hidden Orders in Actinide and Rare Earth Materials  
12:15 - 12:45 Discussion

Lunch Break

14:00 - 14:45 **Peter Wahl** (St Andrews), Atomic scale imaging of strain-tuned emergent phases of matter  
14:45 - 15:15 Discussion  
15:15 - 15:40 **Pabitra Biswas** (Rutherford Lab), New spectroscopic evidence of nodal gap in the basal plane of FeSe superconductor  
15:40 - 15:55 Discussion  
15:55 - 16:15 Coffee/Tea and discussions  
16:15 - 17:00 **Peter Johnson** (Brookhaven Lab), A new ARPES perspective on the cuprate superconductors  
17:00 - 17:30 Discussion

**Tuesday 12 June** 11 Bedford Square, Room 1-01, London, WC1B 3RF

09:45 - 10:00 Coffee/Tea  
10:00 - 10:45 **Suchitra Sebastian** (Cambridge), Fermi surfaces in Kondo insulators  
10:45 - 11:15 Discussion  
11:15 - 11:30 Coffee/Tea  
11:30 - 12:15 **Phil King** (St Andrews), ARPES studies of Delafossite-based transition-metal oxides  
12:15 - 12:45 Discussion

Lunch Break

14:00 - 14:45 **Sven Friedemann** (Bristol), Correlated Electrons at the Border of Charge and Magnetic Order in d-Metals  
14:45 - 15:15 Discussion  
15:15 - 15:40 **Yury Sherkunov** (Loughborough), Effects of Lifshitz transitions in ferromagnetic superconductors  
15:40 - 15:55 Discussion  
15:55 - 16:15 Coffee/Tea and discussions  
16:15 - 17:00 **Vijay Sagar** (MIT), Topology of finite-lifetime quasiparticles and non-Hermitian quantum mechanics

17:00 - 17:30 Discussion

**Wednesday 13 June Rutherford Appleton Laboratory - Pickavance Lecture Theatre, R22**

10:45 - 11:00 Coffee/Tea

11:00 - 11:45 **Laura Greene** (National High Magnetic Field Laboratory), Planar Tunneling spectroscopic Studies of the Kondo Insulator SmB<sub>6</sub>: Topological States and Bulk Spin Excitons

11:45 - 12:00 Discussion

12:00 - 12:45 **Piers Coleman** (Rutgers/RHUL), SCES in the Quantum Information era: New challenges and paradigms

12:45 - 13:00 Discussion

Lunch Break

14:00 - 14:45 **Peter Johnson** (Brookhaven Lab), Topology meets Superconductivity

14:45 - 15:00 Discussion

**Thursday 14 June Royal Holloway College, Egham Hill, Egham, Surrey TW20 0EX - Windsor Building**

Discussion led by **Piers Coleman, Matthias Eschrig, Peter Johnson** and **Gil Lonzarich**:  
Open forum on Big Questions in Quantum Materials and how theory and spectroscopy can help to solve them?

14:30 - 15:30 Brief presentations - Windsor Building 1-02

15:30 - 16:00 Coffee/Tea

16:00 - 17:00 Open discussion

**An evening with Physics and Musics** - to attend, please register at the link:  
<https://physicsandmusic.eventbrite.co.uk/>

18:00 **Laura Greene** (National High Magnetic Field Laboratory),  
The dark energy of quantum materials  
Windsor Auditorium

20:00 **Ian Hobson**,  
Piano performance  
Picture Gallery, Founders Building

# Condensed Matter Physics in the City 2018

## week 2: 18 - 22 June

**Monday 18 June**

**11 Bedford Square, Room 1-01, London, WC1B 3RF**

- 09:45 - 10:00 Coffee/Tea  
10:00 - 10:45 **Ali Yazdani** (Princeton), Visualizing Quantum Hall Nematics and their novel boundary modes  
10:45 - 11:15 Discussion  
11:15 - 11:30 Coffee/Tea and discussions  
11:30 - 12:15 **Liang Fu** (MIT), Topology of finite-lifetime quasiparticles and non-Hermitian quantum mechanics  
12:15 - 12:45 Discussion
- Lunch Break
- 14:00 - 14:25 **Jakob Böker** (Bochum), s<sub>+</sub>is Superconductivity with incipient bands: doping dependence and STM signatures  
14:25 - 14:40 Discussion  
14:40 - 15:25 **Inna Vishik** (UC Davis), ARPES studies of the model cuprate Hg1201  
15:25 - 15:55 Discussion  
15:55 - 16:30 Coffee/Tea and discussions  
16:30 - 16:55 **Luke Rhodes** (Royal Holloway), Scaling of the superconducting gap with orbital character in FeSe  
16:55 - 17:10 Discussion  
17:10 - 17:35 **Matthew Watson** (St Andrews), kz-selective hybridisation of Se 4p and Ti 3d states at the CDW transition of TiSe<sub>2</sub>  
17:35 - 17:50 Discussion

**Tuesday, June 19**

**11 Bedford Square, Room 1-01, London, WC1B 3RF**

- 09:45 - 10:00 Coffee/Tea  
10:00 - 10:45 **Andrew Huxley** (Edinburgh), Quantum criticality and Kondo physics inside a magnetically ordered state  
10:45 - 11:15 Discussion  
11:15 - 11:30 Coffee/Tea  
11:30 - 12:15 **Qiuyun Chen** (Mianyang), Electronic structure study of the heavy fermion Ce115 compounds by ARPES  
12:15 - 12:45 Discussion
- Lunch Break
- 14:00 - 14:45 **Gil Lonzarich** (Cambridge), The enigmatic quantum paraelectric and superconducting states of SrTiO<sub>3</sub>  
14:45 - 15:15 Discussion  
15:15 - 15:40 **Julia Link** (Karlsruhe), Out-of-Bounds Hydrodynamics in Anisotropic Dirac Fluids

15:40 - 15:55 Discussion  
 15:55 - 16:15 Coffee/Tea  
 16:15 - 16:40 **Mumnuna Qureshi** (Loughborough), BBGKY chain and kinetic equations for many body systems out of equilibrium  
 16:40 - 16:55 Discussion  
 16:55 - 17:20 **Vincent Sacksteder** (Royal Holloway), Quantized Repetitions of the Cuprate Pseudogap Line  
 17:20 - 17:30 Discussion

**Wednesday 20 June Rutherford Appleton Laboratory - Diamond G.59**

10:45 - 11:00 Coffee/Tea  
 11:00 - 11:45 **Ali Yazdani** (Princeton), Majoranas in chains and hinges  
 11:45 - 12:00 Discussion  
 12:00 - 12:45 **Inna Vishik** (UC Davis), Electronic structure and dynamics in unconventional superconductors  
 12:45 - 13:00 Discussion

Lunch Break

14:00 - 14:45 **Hong Ding** (Institute of Physics, Chinese Academy of Sciences), Eureka: novel fermions in solid universe  
 14:45 - 15:00 Discussion  
 15:00 - 15:45 **Liang Fu** (MIT), New results on Hall and thermoelectric effects  
 15:45 - 16:00 Discussion

**Thursday 21 June 11 Bedford Square, Room 1-01, London, WC1B 3RF**

09:45 - 10:00 Coffee/Tea  
 10:00 - 10:45 **Silke Biermann** (Ecole Polytechnique), Non-local Coulomb correlations in iridates  
 10:45 - 11:15 Discussion  
 11:15 - 11:30 Coffee/Tea and discussions  
 11:30 - 12:15 **Marcelo Rozenberg** (LPS Orsay), Resolving the chicken and the egg controversy in Mott vanadates  
 12:15 - 12:45 Discussion

Lunch Break

14:00 - 14:45 **Zlatko Papić** (Leeds), Quantum many-body scars  
 14:45 - 15:15 Discussion  
 15:15 - 15:40 **Simon Lieu** (Imperial College), Disorder protected and induced local zero-modes in longer-range Kitaev chains  
 15:40 - 15:55 Discussion  
 15:55 - 16:25 Coffee/Tea and discussions  
 16:25 - 16:50 **Alexandre Jaoui** (ESPCI Paris), Departure from the Wiedemann-Franz law in WP2 driven by mismatch in T-square resistivity prefactors  
 16:50 - 17:00 Discussion

16:50 - 17:15 **Felix Flicker** (Oxford), Enhanced Gyrotropic Magnetic Effect from Multifold Fermions  
17:15 - 17:25 Discussion  
17:25 - 17:50 **Christopher Winterowd** (University of Kent), Combining diagrammatic Monte-Carlo with large-N field theory  
17:50 - 18:00 Discussion

**Friday 22 June**

**11 Bedford Square, Room 1-01, London, WC1B 3RF**

09:45 - 10:00 Coffee/Tea  
10:00 - 10:45 **Hong Ding** (Institute of Physics, Chinese Academy of Sciences), Majorana bound state in the iron-based superconductor Fe(Te, Se)  
10:45 - 11:15 Discussion  
11:15 - 11:30 Coffee/Tea  
11:30 - 11:55 **Elliot Christou** (UCL), Hidden charge order of interacting Dirac fermions on the honeycomb lattice  
11:55 - 12:10 Discussion  
Lunch Break  
14:00 - 14:25 **Yiwei Li** (Oxford), Degeneracy-Enhanced Band Gap in the Weak-Coupling Charge Density Wave System 2H-TaSe<sub>2</sub>  
14:25 - 14:40 Discussion

**Useful links:**

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**Conference webpage:**

<https://www.royalholloway.ac.uk/research-and-teaching/departments-and-schools/physics/events/condensed-matter-physics-in-the-city-2018/>

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**An evening with Physics and Musics - 14 June**

<https://www.royalholloway.ac.uk/research-and-teaching/departments-and-schools/physics/events/an-evening-with-physics-and-music/>

**To attend, please register at the link:** <https://physicsandmusic.eventbrite.co.uk/>

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**Directions:**

**11 Bedford Square, Room G3, London, WC1B 3RF:** <https://intranet.royalholloway.ac.uk/staff/campus-life/bedford-square-and-senate-house/bedford-square-and-senate-house.aspx?>

**Royal Holloway College, Egham Hill, Egham, Surrey TW20 0EX -**

**Windsor Auditorium:** <https://www.royalholloway.ac.uk/about-us/more/how-to-find-us/>

**Rutherford Appleton Laboratory:** <https://stfc.ukri.org/about-us/where-we-work/rutherford-appleton-laboratory/how-to-get-to-rutherford-appleton-laboratory/>