2014 Boulder Summer School  
Modern Aspects of Superconductivity  
June 30-July 25, 2014

Detailed schedule
All Lectures are in Duane Physics Room G125  
Public Lectures are in Duane Physics Room G1B20

Sunday, June 29th
6:30pm – 8:30pm  
Registration mixer with refreshments  
WeatherTech Café in the C4C

Week 1, June 30 - July 3

Monday, June 30th
8:30 – 9:00  
Leo Radzihovsky  
Welcome and Introduction
9:00 – 10:30  
Randeria  
Phenomenology of HTSC in cuprates
10:30 – 11:00  
Coffee Break
11:00 – 12:30  
Sigrist  
Symmetry aspects of unconventional superconductivity I
14:30 – 16:00  
Dessau  
Fundamentals and Applications of ARPES on correlated and superconducting electron systems
16:15 – 17:15  
Student introductions

Tuesday, July 1st
9:00 – 10:30  
Sigrist  
Symmetry aspects of unconventional superconductivity II
10:30 – 11:00  
Coffee Break
11:00 – 12:30  
Randeria  
Quantum Oscillations, X-ray experiments
14:30 – 16:00  
Dessau  
ARPES studies of high-$T_c$ superconductors
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>19:00 – 20:00</td>
<td><strong>Soundbites I</strong></td>
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<td><strong>Wednesday, July 2^{nd}</strong></td>
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<tr>
<td>9:00 – 10:30</td>
<td><strong>Randeria</strong>&lt;br&gt;ARPES, STM experiments</td>
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<td>10:30 – 11:00</td>
<td>Coffee Break</td>
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<td>11:00 – 12:30</td>
<td><strong>Martinis</strong>&lt;br&gt;Quantum computing and error correction</td>
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<td>14:30 – 16:00</td>
<td><strong>Sigrist</strong>&lt;br&gt;Symmetry aspects of unconventional superconductors III</td>
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<td>19:00 – 21:30</td>
<td><strong>Poster Session I</strong>&lt;br&gt;11th Floor Gamow Tower</td>
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<td><strong>Thursday, July 3^{rd}</strong></td>
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<tr>
<td>9:00 – 10:30</td>
<td><strong>Sigrist</strong>&lt;br&gt;Symmetry aspects of unconventional superconductors IV</td>
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<td>10:30 – 11:00</td>
<td>Coffee Break</td>
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<tr>
<td>11:00 – 12:30</td>
<td><strong>Martinis</strong>&lt;br&gt;Superconducting qubits</td>
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<td>14:30 – 16:00</td>
<td><strong>Randeria</strong>&lt;br&gt;Review of BCS-BEC Crossover &amp; Unitary Fermi gas as an example of strongly interacting paired superfluid</td>
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<td>16:30 - 18:00</td>
<td>Q and A Session</td>
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<td>18:00 - 19:00</td>
<td>BBQ (Dirks East Courtyard, C4C)</td>
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<td><strong>Friday, July 4^{th}</strong></td>
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<td><strong>Holiday</strong></td>
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**Week 2, July 7 - 11**

**Monday, July 7^{th}**

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<th>Time</th>
<th>Event</th>
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<tr>
<td>9:00 – 10:30</td>
<td><strong>Kivelson</strong>&lt;br&gt;Modern aspects of superconductivity I</td>
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<td>10:30 – 11:00</td>
<td>Coffee Break</td>
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<tr>
<td>11:00 – 12:30</td>
<td><strong>Keimer</strong></td>
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Neutron and X-ray scattering studies of superconductors I

14:30 – 16:00
Senthil
Superconductivity near the Mott transition I

Tuesday, July 8th

9:00 – 10:30
Keimer
Neutron and X-ray scattering studies of superconductors II

10:30 – 11:00
Coffee Break

11:00 – 12:30
Kivelson
Modern aspects of superconductivity II

14:30 – 16:00
Senthil
Superconductivity near the Mott transition II

17:00 – 20:00
Flagstaff Picnic

Wednesday, July 9th

9:00 – 10:30
Boebinger
Evidence for a phase transition near optimum doping in the
cuprates (1995 to present).

10:30 – 11:00
Coffee Break

11:00 – 12:30
Keimer
Neutron and X-ray scattering studies of superconductors III

14:30 – 16:00
Vafek
d-wave quasiparticles in the vortex state

19:00 – 21:30
Public Lecture

Thursday, July 10th

9:00 – 10:30
Paramekanti
Strong coupling aspects of superconductivity I

10:30 – 11:00
Coffee Break

11:00 – 12:30
Boebinger
Specific heat studies of the cuprates.

14:30 – 16:00
Kivelson
Modern aspects of superconductivity III

16:30 - 18:30
Q and A Session

Friday, July 11th

9:00 – 10:30
Vafek
Quasiparticle thermal Hall transport in d-wave
superconductors
Week 3, July 14 - 18

Monday, July 14th

9:00 – 10:30  
**Sachdev**  
*Magnetism and superconductivity I*

10:30 – 11:00  
Coffee Break

11:00 – 12:30  
**Millis**  
*Theory of Superconductivity I*

14:00 – 15:30  
**Sachdev**  
*Magnetism and superconductivity II*

15:45 – 17:15  
**Coleman**  
*The physics of heavy-fermion superconductors I*

Tuesday, July 15th

9:00 – 10:30  
**Sachdev**  
*Magnetism and superconductivity III*

10:30 – 11:00  
Coffee Break

11:00 – 12:30  
**Sachdev**  
*Magnetism and superconductivity IV*

14:00 – 15:30  
**Coleman**  
*The physics of heavy-fermion superconductors II*

15:45 – 17:15  
**Millis**  
*Theory of superconductivity II*

19:00 - 20:00  
**Soundbites II**

Wednesday, July 16th

9:00 – 10:30  
**Millis**  
*Theory of superconductivity III*

10:30 – 11:00  
Coffee Break
11:00 – 12:30  Matsuda  
Iron-based superconductors I

14:00 – 15:30  Coleman  
The physics of heavy-fermion superconductors III

19:00 – 21:30  Poster Session III  
11th Floor Gamow Tower

Thursday, July 17th

9:00 – 10:30  Coleman  
The physics of heavy-fermion superconductors IV

10:30 – 11:00  Coffee Break

11:00 – 12:30  Millis  
Theory of Superconductivity IV

14:00 – 15:30  Matsuda  
Iron-based superconductors II

16:30 - 18:30  Q and A session

Friday, July 18th

9:00 – 10:30  Matsuda  
Iron-based superconductors III

10:30 – 11:00  Coffee Break

11:00 – 12:30  Dessau  
Recent developments

18:00 – 19:00  BBQ (Dirks East Courtyard, C4C)
Tuesday, July 22nd

9:00 – 10:30  Orenstein  
Optical Properties of superconductors II
10:30 – 11:00 Coffee Break
11:00 – 12:30 Hoffman  
STM studies of modern superconductors I
14:30 – 16:00 Radzihovsky  
P-wave Feshbach resonant superfluidity
19:00 - 20:00 Soundbites III

Wednesday, July 23rd

9:00 – 10:30  Hoffman  
STM studies of modern superconductors II
10:30 – 11:00 Coffee Break
11:00 – 12:30 Fu  
Topological superconductivity I
14:30 – 16:00 Chubukov  
Superconductivity due to repulsive interactions I
19:00 - 21:30 Poster session III  
11th Floor Gamow Tower

Thursday, July 24th

9:00 – 10:30  Fu  
Topological superconductivity II
10:30 – 11:00 Coffee Break
11:00 – 12:30 Chubukov  
Superconductivity due to repulsive interactions II
14:30 – 16:00 Orenstein  
Optical Properties of superconductors III
18:00 – 19:00 BBQ (Dirks East Courtyard, C4C)

Friday, July 25th

9:00 – 10:30  Chubukov  
Superconductivity due to repulsive interactions III
10:30 – 11:00 Coffee Break
11:00 – 12:30 Q and A session