

MONDAY, 7<sup>th</sup> March, 2016

**SHORT COURSE DETAILS**

| TIME           | Cryocooler Technology: Advances & Applications  | HTS Material for Power application  |
|----------------|---|---|
| 11:00 to 12:30 | <p><b>Speaker: Prof. M.D. Atrey</b></p> <p><i>The basics of cryogenics and cryocoolers.</i></p> <ol style="list-style-type: none"> <li>1. Classification, working principle of various cryocoolers and review of related thermodynamics.</li> <li>2. Theoretical aspects related to design of various cryocoolers.</li> </ol>   | <p><b>Speaker: Prof. V. Selvamanickam</b></p> <ol style="list-style-type: none"> <li>1. Power Applications of Superconductors</li> <li>2. Low temperature Superconductors<br/>Nb-Ti alloys<br/>A15 materials</li> <li>3. High temperature Superconductors (HTS)</li> </ol>  |
| LUNCH BREAK    |   |   |
| 14:00 to 15:00 | <p><b>Speaker: Dr Chao Wang</b></p> <p><i>Advances in cryocoolers, brief introduction of regenerative and some other types of cryocoolers:</i></p> <ol style="list-style-type: none"> <li>1. Development of large cooling capacity cryocoolers, such as Stirling, Pulse Tube and GM cryocoolers</li> <li>2. Development of space cryocoolers for lower temperatures (4-20K), compact size and better efficiency</li> <li>3. Development and commercialization of 4 K GM and pulse tube cryocoolers.</li> <li>4. Innovations of cryocoolers for better system efficiency.</li> </ol> | <p><b>Speaker: Prof. V. Selvamanickam</b></p> <ol style="list-style-type: none"> <li>4. Overcoming challenges in critical currents of HTS<br/>Anisotropy<br/>Grain Boundaries<br/>Flux pinning and Flux creep</li> <li>5. Methods to fabricate HTS wires</li> <li>6. Current status in improvement of HTS wires for power applications</li> </ol> |
| TEA BREAK      |   |   |
| 15:30 to 14:30 | <p><b>Speaker: Dr Chao Wang</b></p> <p><i>Application of cryocoolers:</i></p> <ol style="list-style-type: none"> <li>1. Cooling cryopumps</li> <li>2. Cooling detectors</li> <li>3. Cooling high temperature superconductors</li> <li>4. 4 K cryocoolers for cryogen-free systems (dry system)</li> <li>5. 4 K cryocoolers for recondensing or liquefying helium for liquid helium cooled systems</li> </ol>  |   |