Programme of the 14\textsuperscript{th} Karlsruhe International School on Fusion Technologies

11.04.2022

**Monday 05/09/2022**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30-8:45</td>
<td>Opening of the summer school</td>
<td>M. Ionescu-Bujor</td>
</tr>
<tr>
<td>8:45-9:20</td>
<td>Topic 1: Introduction to fusion</td>
<td>R. Kembleton</td>
</tr>
<tr>
<td>9:20-9:55</td>
<td>Future energy and the role for fusion</td>
<td>R. Kembleton</td>
</tr>
<tr>
<td>9:55-10:30</td>
<td>Fusion and the characteristics of fusion power plants</td>
<td>R. Kembleton</td>
</tr>
<tr>
<td>10:30-10:45</td>
<td>Basic physics of a tokamak</td>
<td>R. Kembleton</td>
</tr>
<tr>
<td>10:45-11:30</td>
<td>DEMO and the road to fusion power (I)</td>
<td>S. Muldrew</td>
</tr>
<tr>
<td>11:30-12:15</td>
<td>DEMO and the road to fusion power (II)</td>
<td>S. Muldrew</td>
</tr>
<tr>
<td>13:45-14:45</td>
<td>Topic 2: Plasma physics</td>
<td></td>
</tr>
<tr>
<td>14:45-15:00</td>
<td>Introduction to plasma physics</td>
<td></td>
</tr>
<tr>
<td>14:45-15:00</td>
<td>coffee break</td>
<td></td>
</tr>
<tr>
<td>15:00-16:15</td>
<td>Topic 3: Neutronics and activation analysis</td>
<td>D. Leichtle</td>
</tr>
<tr>
<td>15:00-16:15</td>
<td>Fusion neutronics – methods, data, applications</td>
<td></td>
</tr>
</tbody>
</table>

**Tuesday 06/09/2022**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00-9:15</td>
<td>Topic 4: Plasma heating technology and plasma diagnostics</td>
<td>S. Illy</td>
</tr>
<tr>
<td>9:15-10:15</td>
<td>Introduction to neutral beam injection technology</td>
<td>A.Shepherd</td>
</tr>
<tr>
<td>10:15-11:15</td>
<td>Plasma diagnostics in fusion devices</td>
<td>R. Sabot</td>
</tr>
<tr>
<td>11:15-11:30</td>
<td>coffee break</td>
<td></td>
</tr>
<tr>
<td>11:30-12:30</td>
<td>Visit to Gyrotron Test Stand</td>
<td>S. Illy</td>
</tr>
<tr>
<td>13:30-15:00</td>
<td>Topic 5: The fuel cycle of a fusion reactor</td>
<td>C. Day</td>
</tr>
<tr>
<td>15:00-15:15</td>
<td>Fuel cycle</td>
<td></td>
</tr>
<tr>
<td>15:15-16:30</td>
<td>Visit to Tritium Laboratory Karlsruhe</td>
<td>R. Größle</td>
</tr>
</tbody>
</table>
Programme of the
14th Karlsruhe International School on Fusion Technologies

**Wednesday 07/09/2022**

<table>
<thead>
<tr>
<th>Topic 6: Blankets</th>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8:00-9:00</td>
<td>Basics of breeding blanket technology I</td>
<td>F. Hernandez</td>
</tr>
<tr>
<td></td>
<td>9:00-9:45</td>
<td>Solid breeder and Liquid metal breeder blankets (European concepts)</td>
<td>F. Hernandez</td>
</tr>
<tr>
<td></td>
<td>9:45-10:00</td>
<td>coffee break</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10:00-11:00</td>
<td>Tritium Processing in Breeding Blankets and Test Blanket Systems</td>
<td>I. Ricapito</td>
</tr>
<tr>
<td></td>
<td>11:00-11:40</td>
<td>Solid tritium breeder materials</td>
<td>J. Leys</td>
</tr>
<tr>
<td></td>
<td>11:40-12:40</td>
<td>Magnetohydrodynamics of liquid metals</td>
<td>L. Bühler</td>
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</tbody>
</table>

**Topic 7: Technology of magnetic confinement**

<table>
<thead>
<tr>
<th>Time</th>
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</tr>
</thead>
<tbody>
<tr>
<td>13:30-15:00</td>
<td>Superconductivity and magnet technology</td>
<td>W. Fietz</td>
</tr>
<tr>
<td>15:00-15:15</td>
<td>coffee break</td>
<td></td>
</tr>
<tr>
<td>15:15-16:30</td>
<td>High-Temperature Superconductivity</td>
<td>W. Fietz</td>
</tr>
</tbody>
</table>

**Thursday 08/09/2022**

<table>
<thead>
<tr>
<th>Topic 8: Materials development for fusion reactors</th>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8:00-9:00</td>
<td>Basic Course on Irradiation Damage, Part I: Material Properties and Related Mechanisms</td>
<td>M. Rieth</td>
</tr>
<tr>
<td></td>
<td>9:00-9:15</td>
<td>coffee break</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9:15-10:15</td>
<td>Part II: Effect of Neutron Irradiation on Solids</td>
<td>M. Rieth</td>
</tr>
</tbody>
</table>

**Topic 9: Divertors**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:15-11:15</td>
<td>Manufacturing processes for High Heat Flux Components</td>
<td>E. Visca</td>
</tr>
</tbody>
</table>

**Topic 10: Safety, socioeconomics and waste**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:15-12:15</td>
<td>Practical Implementation of nuclear engineering aspects within the ITER Electron Cyclotron Launcher</td>
<td>P. Wouters</td>
</tr>
<tr>
<td>13:15-14:15</td>
<td>General safety analysis approach and techniques</td>
<td>D. Dongiovanni</td>
</tr>
<tr>
<td>14:15-14:30</td>
<td>coffee break</td>
<td></td>
</tr>
<tr>
<td>14:30-16:30</td>
<td>Visit of Fusion Materials Laboratory</td>
<td>H.-C. Schneider</td>
</tr>
</tbody>
</table>
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Friday 09/09/2022

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00-9:40</td>
<td>Remote handling maintenance scheme I</td>
<td>M. Mittwollen</td>
</tr>
<tr>
<td>9:40-10:20</td>
<td>Remote handling maintenance scheme II</td>
<td>M. Mittwollen</td>
</tr>
<tr>
<td>10:20-10:35</td>
<td>coffee break</td>
<td></td>
</tr>
<tr>
<td>10:35-11:35</td>
<td>ASDEX upgrade</td>
<td>W. Suttrop</td>
</tr>
<tr>
<td>11:35-12:35</td>
<td>Wendelstein 7-X</td>
<td>R. Wolf</td>
</tr>
<tr>
<td>12:35-12:50</td>
<td>Final discussion, hand-out of certificates</td>
<td>M. Ionescu-Bujor</td>
</tr>
</tbody>
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