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11.04.2022

Monday 05/09/2022








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

Tuesday 06/09/2022







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|--|---|-------------|---|
| Topic 4: Plasma heating technology and plasma diagnostics | | | |
| 08:00-9:15 | Gyrotrons | S. Illy |  |
| 9:15-10:15 | Introduction to neutral beam injection technology | A. Shepherd |  |
| 10:15-11:15 | Plasma diagnostics in fusion devices | R. Sabot |  |
| 11:15-11:30 | coffee break | | |
| 11:30-12:30 | Visit to Gyrotron Test Stand | S. Illy |  |
| Topic 5: The fuel cycle of a fusion reactor | | | |
| 13:30-15:00 | Fuel cycle | C. Day |  |
| 15:00-15:15 | coffee break | | |
| 15:15-16:30 | Visit to Tritium Laboratory Karlsruhe | R. Größle |  |

Programme of the 14th Karlsruhe International School on Fusion Technologies

Wednesday 07/09/2022






| Topic 6: Blankets | | | |
|--|---|--------------|--|
| 8:00-9:00 | Basics of breeding blanket technology I | F. Hernandez |  |
| 9:00-9:45 | Solid breeder and Liquid metal breeder blankets (European concepts) | F. Hernandez |  |
| 9:45-10:00 | coffee break | | |
| 10:00-11:00 | Tritium Processing in Breeding Blankets and Test Blanket Systems | I. Ricapito |  |
| 11:00-11:40 | Solid tritium breeder materials | J. Leys |  |
| 11:40-12:40 | Magnetohydrodynamics of liquid metals | L. Bühler |  |
| Topic 7: Technology of magnetic confinement | | | |
| 13:30-15:00 | Superconductivity and magnet technology | W. Fietz |  |
| 15:00-15:15 | coffee break | | |
| 15:15-16:30 | High-Temperature Superconductivity | W. Fietz |  |

Thursday 08/09/2022

| Topic 8: Materials development for fusion reactors | | | |
|---|---|-----------------|---|
| 8:00-9:00 | Basic Course on Irradiation Damage, Part I: Material Properties and Related Mechanisms | M. Rieth |  |
| 9:00-9:15 | coffee break | | |
| 9:15-10:15 | Part II: Effect of Neutron Irradiation on Solids | M. Rieth |  |
| Topic 9: Divertors | | | |
| 10:15-11:15 | Manufacturing processes for High Heat Flux Components | E. Visca |  |
| Topic 10: Safety, socioeconomics and waste | | | |
| 11:15-12:15 | Practical Implementation of nuclear engineering aspects within the ITER Electron Cyclotron Launcher | P. Wouters |  |
| 13:15-14:15 | General safety analysis approach and techniques | D. Dongiovanni |  |
| 14:15-14:30 | coffee break | | |
| 14:30-16:30 | Visit of Fusion Materials Laboratory | H.-C. Schneider |  |

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Friday 09/09/2022

| Topic 11: Remote handling, maintenance scheme | | | |
|--|--|------------------|---|
| 9:00-9:40 | Remote handling maintenance scheme I | M. Mittwollen |  |
| 9:40-10:20 | Remote handling maintenance scheme II | M. Mittwollen |  |
| 10:20-10:35 | coffee break | | |
| Topic 12: Operating and planned facilities | | | |
| 10:35-11:35 | ASDEX upgrade | W. Suttrop |  |
| 11:35-12:35 | Wendelstein 7-X | R. Wolf |  |
| 12:35-12:50 | Final discussion, hand-out of certificates | M. Ionescu-Bujor |  |