

Programme

Mo	06/24	09:30-10:00	<i>Admin and Visa Checks</i>
		10:00-13:00	Session 1 (SMS) — Classical vs Quantum Control
		13:00-14:00	<i>Lunch</i>
		14:00-17:00	Session 2 (SMS) — New Ideas for Quantum Control
		19:00-21:00	<i>Welcome Dinner in Cardiff</i>
Tu	06/25	09:30-12:30	Session 3 (FCL) — Bayesian Learning and Parameter Estimation
		12:30-14:00	<i>Lunch</i>
		14:00-17:00	Session 4 (FCL) — Machine learning
		17:00	<i>Free to explore on your own</i>
We	06/26	09:30-12:30	Session 5 — Guest lectures & discussion (Chris, Carrie, Anastasia)
		12:30-14:00	<i>Lunch</i>
		14:00-19:00	<i>Cardiff Castle (£13, 09:00-18:00) and walking tour of city</i>
Th	06/27	09:30-12:30	Session 6 (EJ) — Robust control fundamental limitations
		12:30-14:00	<i>Lunch</i>
		14:00-17:00	Session 7 (EJ) — Structured uncertainties in spin networks
		19:00-21:00	<i>Dinner in Cardiff</i>
Fr	06/28	09:30-12:30	Session 8 — Participant presentation session
		12:30-13:30	<i>Lunch</i>
		13:30-17:00	<i>Welsh Heritage Centre, St Fagans (free, 10:00-17:00)</i>
		17:00-18:00	Transfer to Marriott-St Pierre (from St Fagans or Cardiff)
		19:00-21:00	<i>Dinner at Marriott-St Pierre</i>
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Sa	06/29	09:30-12:30	Session 9 — Practical work and discussion session
		12:30-14:00	<i>Lunch</i>
		14:00-17:00	Session 10 — Practical work and discussion session
		18:00	<i>Dinner at Marriott-St Pierre</i>
Su	06/30	09:30-12:30	Session 11 — Discussions and planning for week 2
		12:30-13:00	<i>Lunch at Marriott St Pierre</i>
		13:30-16:30	<i>Visit to Tintern Abbey (£7.30, 9:30-17:00)</i>
		16:30	Transfer to Swansea
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Mo	07/01	09:30-12:30	Session 12
		12:30-14:00	<i>Lunch</i>
		14:00-17:00	Session 13
		18:00	<i>Swansea Marina and Dinner (Meridian Tower)</i>
Tu	07/02	09:30-12:30	Session 14 — Guest lectures, Lab Tours, Discussion
		12:30-14:00	<i>Lunch</i>
		14:00-19:00	<i>Brecon Beacons or Pembrokeshire Trip</i>
We	07/03	09:30-12:30	Session 15
		12:30-14:00	<i>Lunch</i>
		14:00-17:00	Session 16
		19:00-21:00	<i>Dinner at Mumbles</i>
Th	07/04	09:30-12:30	Session 17 — Guest lectures, Lab Tours, Discussion
		12:30-14:00	<i>Lunch</i>
		14:00-19:00	<i>Gower trip (Arrows, Talons and Tea at Perriswood, Dinner at Wormshead)</i>
Fr	07/05	09:30-12:30	Session 18
		12:30-14:00	<i>Lunch</i>
		14:00-17:00	Session 19 — Participant final presentations
		17:00	<i>Free time</i>
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Sa	07/06	<i>Welsh National Airshow (Swansea)</i>	
Su	07/07	<i>Welsh National Airshow (Swansea)</i>	

Topics to be covered

- Overview of quantum control vs classical control, open-loop vs feedback
- Modelling quantum systems, dynamics and control, control problems
- Introduction to spin networks, energy landscape shaping, reservoir engineering

- Bayesian techniques of model identification and parameter estimation
- Machine learning and optimisation techniques
- Efficient and effective coding, parallel and HPC issues (clusters, GPUs, etc.);

- Classical robust control and challenges in application to quantum systems
- Robustness and decoherence
- Specialized structured robust performance

- Emergence of classicality under decoherence (Sec. 4.3)
- Quantum thermodynamics and control
- Finding model parameters / Bayesian analysis, using empirical models instead, linking the two, add some machine learning and quantum machine learning in the problem context.

Suggested Excursions (not part of official programme)

06/24 Mo eve Welcome dinner at Bil's <https://bills-website.co.uk/restaurants/cardiff-city-centre>

06/25 Tu eve free – suggest walking tour of the city, maybe stroll through Sophia Gardens

06/26 We pm Cardiff Castle <https://www.cardiffcastle.com> (£13, 09:00-18:00), walking tour of city

06/27 Th pm Dinner – suggestion The Clink (<https://theclinkcharity.org/restaurants/cardiff>)

06/28 Fr pm Welsh Heritage Centre, St Fagans (free, 10:00-17:00) <https://museum.wales/stfagans/>

06/30 Su am Tintern Abbey (£7.30, 9:30-17:00) <https://cadw.gov.wales/visit/places-to-visit/tintern-abbey/>

07/01 Mo eve Swansea Marina and Dinner (Grape & Olive, Meridian Tower)
<https://www.sabrain.com/pubs-and-hotels/south-wales/swansea/grape-olive-swansea/>

07/02 Tu pm Some options: Tawe River Cruise <https://www.scbt.org.uk/>
Gower Coast Adventures <http://www.gowercoastadventures.co.uk/>
Craigynos Castle and National Showcaves <https://www.craigynoscastle.com/>,
<http://www.showcaves.co.uk/> (nice walks nearby too)
Tenby, Pembrokeshire <https://en.wikipedia.org/wiki/Tenby>
Go Ape at Margam <https://goape.co.uk/days-out/wales/margam>

07/03 We eve Dinner at Mumbles (<http://thelounges.co.uk/croeso/>)

07/04 Th pm Gower trip (Arrows, Talons and Tea at Perriswood, Dinner at Wormshead)
<https://www.perriswood.com/parties/> <http://www.explore-gower.co.uk/>

07/06-07/07 National Air Show <http://www.walesnationalairshow.com/>