Tentative Agenda of Dagstuhl Seminar 26422

Cyber Security Experimentation Beyond Exercises and Cyber Ranges

Version: 14.10.2026

Terry Benzel, Maria Leitner, Olaf Maennel and Teodor Sommestad

Time / Day **Focus**	**Day 1** **Monday October 12** *Introduction*	**Day 2** **Tuesday October 13** *Scientific rigor*	**Day 3** **Wednesday October 14** *FAIR principles*	**Day 4** **Thursday October 15** *AI*	**Day 5** **Friday October 16** *Connect*
08:30 - 10:00	Welcome & Introduction	Scenario Generation	Benchmarks and Sharing Data Sets	Talk and Panel on AI in Exercises	Panel Discussion
10:00 – 10:30	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break
10:30 - 12:00	Vision Talks Terry Benzel: "Testbeds and Their Uses" Rain Ottis	Research Infrastructure Management & Monitoring	"FAIR Principles for Software": Anja Lamprecht 11:40 Group Photo	Breakouts on the Impact of AI / World Café: AI for Infrastructure	Wrap-up, Closing Remarks, Farewell
12:00 - 13:30	Lunch	Lunch	Lunch	Lunch	Lunch
13:30 - 15:00	Research Infrastructure Presentations I	Exercise Design and Simulation	Hiking	Breakouts on the Impact of AI / World Café: AI for Analysis	
15:00 – 15:30	Coffee Break	Coffee Break	Coffee Break	Coffee Break	
15:30 - 17:00	Research Infrastructure Presentations II	Teaming & Scoring	Discussion: Main Findings on Scientific Rigor & FAIR Principles in Cyber Security Simulation Infrastructures	Final Breakouts on Participant-Defined Topics	
17:00 - 18:00	Final Introduction, Outlook on the Week	Main Findings and Discussion (fishbowl)	Wrap-up; Planning Topics for Day 4 Breakouts / World Cafés	Poster Session, Breakout Reports and Wrap-up	
18:00 - 19:30	Dinner	Dinner	Dinner	Dinner	

Dagstuhl Seminar 26422: Tentative Programme

- **I** = infrastructure talk (10 min + 5 min questions)
- **R** = research challenge (20 min + 10 min questions)
- Coffee breaks 10:00–10:30 and 15:00–15:30 · Lunch 12:00–13:30 · Dinner 18:00–19:30

This is a **tentative** schedule for infrastructure talks and research challenges based on the participant survey. There will be regular updates to the schedule. Please contact the organizers for changes.

Monday, 12 October: Introduction

1. 08:30–10:00 · Welcome & Introduction (Session Chair: Maria Leitner & Terry Benzel)

- Terry Benzel, Maria Leitner, Olaf Maennel and Teodor Sommestad
- Link to all introduction presentations: https://tinyurl.com/dag26422s1

2. 10:30–12:00 · Vision Talks (Session Chair: Olaf Maennel)

- Terry Benzel: Testbeds and Their Uses
- Rain Ottis

3. 13:30–15:00 · Research Infrastructure Presentations I (Session Chair: Maria Leitner)

- **I1** Virginia L. Wright: Idaho National Laboratory's Critical Infrastructure Test Ranges (CELR, Liberty Eclipse Exercise)
- **I2** Paul Ruth: FABRIC, a national testbed where agents build and break real infrastructure
- **I3** Jan Vykopal: INJECT Exercise Platform
- **I4** Anis bin Yusof: CRADLE: A Testbed-Agnostic Language for Reproducible Cybersecurity Experimentation
- **I5** Muhammad Mudassar Yamin: Open Cyber Range
- **I6** Jelena Mirkovic: SPHERE: Research Infrastructure for Security and Privacy Experimentation
- Link to infrastructure presentations: https://tinyurl.com/dag26422infra

4. 15:30–17:00 · Research Infrastructure Presentations II (Session Chair: Teodor Sommestad)

- **I7** Ulrike Lechner: Serious Games: A Question of Security, Operation Raven, Operation Digital Butterfly
- **I8** Razvan Beuran: CyTrONE: Integrated Cybersecurity Training Framework
- **I9** Tobias Pfaller: Flowgin, a workflow-based orchestration engine for cyber exercises
- **I10** James Hutchins and Anton Ivanov: CyberLab
- **I11** Maria Leitner: CyberCampus: a Cyber Scenario Engine
- Link to infrastructure presentations: https://tinyurl.com/dag26422infra

5. 17:00–18:00 · Final Introduction, Outlook on the Week (Session Chair: Terry Benzel)

- **I12** Lee Rossey: AI Proving Grounds

Tuesday, 13 October: Scientific Rigor

6. 09:00–10:00 · Scenario Generation (Session Chair: Teodor Sommestad)

- **R1** Jan Vykopal: Scenario and infrastructure generation with small language models
- **R2** Maria Leitner: How AI changes scenario preparation and generation

7. 10:30–12:00 · Research Infrastructure Management & Monitoring (Session Chair: Jan Vykopal)

- **R4** James Hutchins: Cyber range provisioning and access for untrusted users
- **R5** Muhammad Mudassar Yamin: Standardisation and federation
- **R6** Anton Ivanov: Network topologies across vendor infrastructures and federated ranges

8. 13:30–15:00 · Exercise Design and Simulation (Session Chair: Rain Ottis)

- **I13** Sebastian Gallenmüller: SLICES-RI/DE: A European/German research infrastructure for ICT
- **R8** Virginia L. Wright: Cyber-informed engineering and a "day without automation" exercise
- **I14** Jan Kohlrausch: Attack simulation for SOCs, supplemented by AI
- Guest: Frederica Uccello: From Protocol-Layer Anomalies to LLM-Assisted Mitigation in 5G

9. 15:30–17:00 · Teaming & Scoring (Session Chair: Iain Phillips)

- **R10** Teodor Sommestad: Benchmarking and scoring cyber defenders
- **R11** Lee Rossey: Measuring live AI agent solutions (red, blue, governance)
- **R12** Ulrike Lechner: Evaluating serious games; AI players and mentors

10. 17:00–18:00 · Main Findings and Discussion (Session Chair: Olaf Maennel)

- **I15** Kristina Raab: Exercises for quantum-threat and PQC-migration awareness

Wednesday, 14 October: FAIR Principles

11. 09:00–10:00 · Analysis and Abstraction of Testbeds (Session Chair: Terry Benzel)

- **R16** Iain Phillips: Abstracting cyber range components; portable ranges (hosted or self-owned); federation
- **R17** Zhenkai Liang: Static analysis of testbeds
- **D1** David Balenson: Extending research infrastructures to testing, training, exercises and CTFs, and what they can learn from the exercise community

12. 10:30–12:00 · "FAIR Principles for Software": Anja Lamprecht (Session Chair: Maria Leitner)

- *11:40 Group photo*

13. 13:30–15:30 · Nationalpark-Tor Keltendorf

Address:

Ringwallstraße 80

66620 Nonnweiler-Otzenhausen

Website: https://nationalpark-tor-keltenpark.de/

Location in Google Maps: https://maps.app.goo.gl/Aud1MTr7jWpDANDn8

14. 15:30–16:30 · World Cafe on FAIR Principles in Cyber Security Simulation Infrastructures

World Cafe: Findable, Accessible, Interoperable, Reproducible

15. 17:00–18:00 · Wrap-up and Results of World Cafe

Thursday, 15 October: AI

16. 09:00–10:00 · Exercise Design (Session Chair: Ulrike Lechner)

- **R21** Magdalena Glas: Interdisciplinary design principles in cyber range exercises
- **R19** Paul Ruth: Agents deploying vs. deployed in infrastructure, and seeing what they did

17. 10:30–12:00 · AI Agents and Infrastructure (Session Chair:)

- **R18** Razvan Beuran: Realistic environments to train RL agents for cyber defence

18. 13:30–15:00 Breakout Session #1

19. 15:30–17:00 · Breakout Session #2

20. 17:00–18:00 · Wrap-up and Next Steps

- **@all**: Questionnaire (see Seminar page)

Friday, 16 October: Connect (tentative)

21. 08:30–10:00 · Panel Discussion

22. 10:30–12:00 · Wrap-up, Closing Remarks, Farewell