IDEA-League Operations Board Meeting: Department of Physics (RWTH)

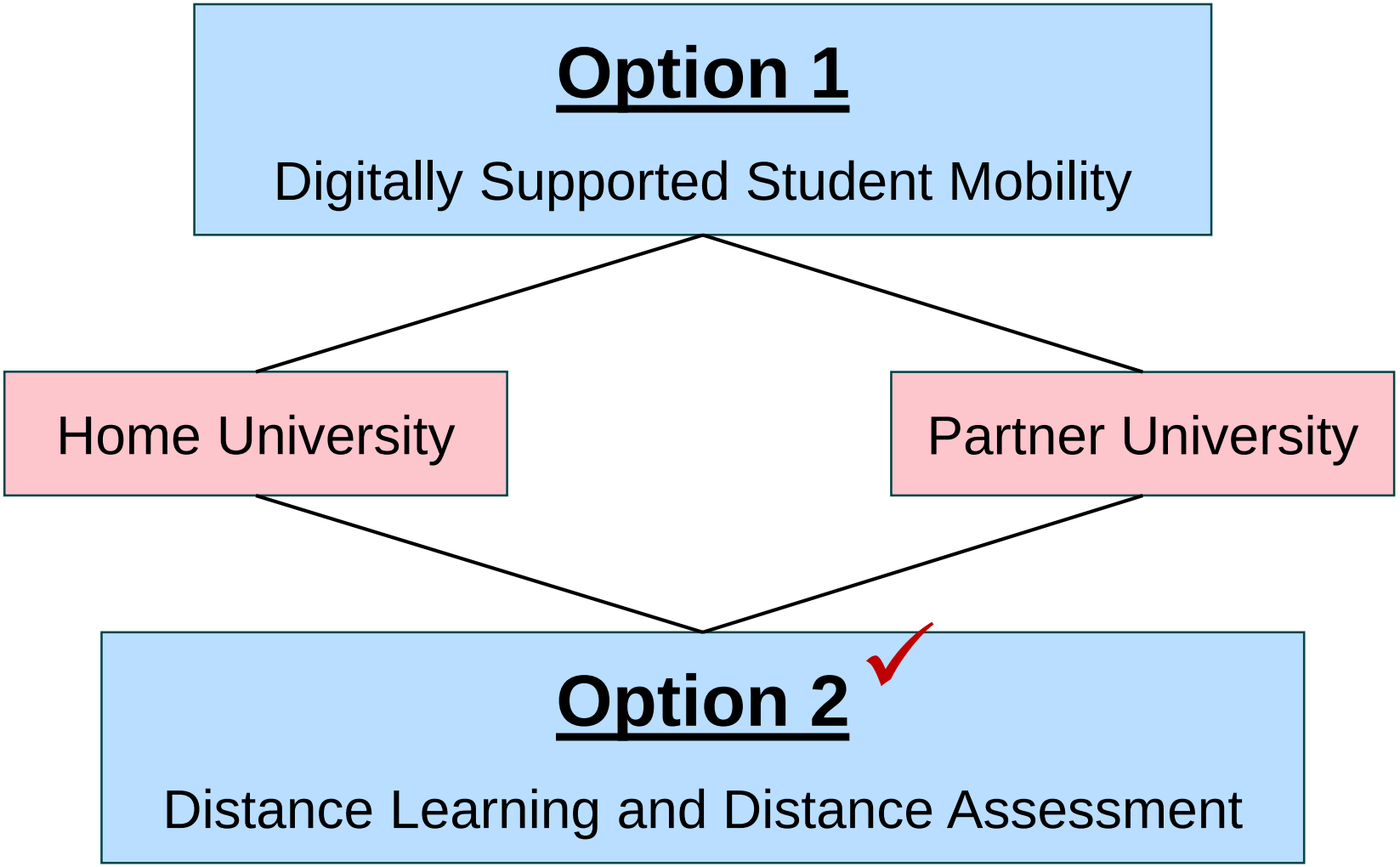
Stefan Roth, Paramita Dey, Anand Sharma, Thomas Radermacher

MyScore

III. Physikalisches Institut B

RWTH AACHEN UNIVERSITY

International Collaborations via MyScore



Distance Learning and Distance Assessment

- Timeline and Overview: Communication with Partner Universities
- Shared Courses in Summer Semester 2020
- Shared Courses in Winter Sememster 2020/21
- Challenges / Outlook

Distance Learning and Distance Assessment

- Timeline and Overview: Communication with Partner Universities
- Shared Courses in Summer Semester 2020
- Shared Courses in Winter Sememster 2020/21
- Challenges / Outlook

Timeline and Overview

- Started with the IDEA-League Partner Universities of RWTH
- First Contact: Chalmers University of Technology, Sweden

- Visited early Feb, 2020
- Discussed possibility of shared courses with many departments
- Advanced topics on Quantum Technology appeared as common interest
- Department of Microtechnology and Nanosciences (MC2) offerred to share a course with RWTH in winter semester 2020/21
- Also learned about their experience in similar exchanges of courses with other universities

Timeline and Overview

- Second Contact: Delft University of Technology, Netherlands

- Visited mid-Feb, 2020, together with the Coordinator of the Quantum Technology track for Masters in Physics at RWTH
- Discussed possibility of shared courses
- Advanced topics on Quantum Technology once again appeared as common interest
- One course was offerred to share with RWTH for the summer semester 2020

- We saw the possibility to share courses among all three universities as early as the 2020 summer semester

Timeline and Overview

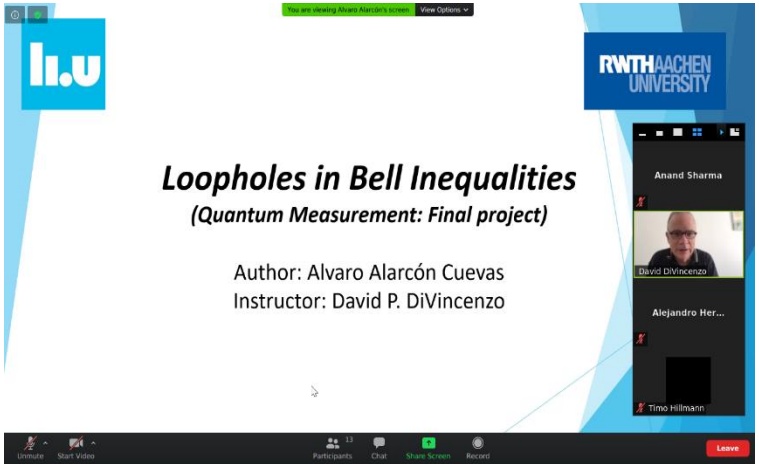
- Shared Courses in Summer Semester 2020
  - Quantum Measurement from RWTH
  - Quantum Error Correction from TU Delft
- Shared Courses in Winter Semester 2020/21
  - Quantum Optics from RWTH
  - Modelling of Supercomputing Devices from TU Delft
  - Quantum Computing from Chalmers

Distance Learning and Distance Assessment

- Timeline and Overview: Communication with Partner Universities
- Shared Courses in Summer Semester 2020
- Shared Courses in Winter Sememster 2020/21
- Challenges / Outlook

Shared Courses in SoSe 2020 (1)

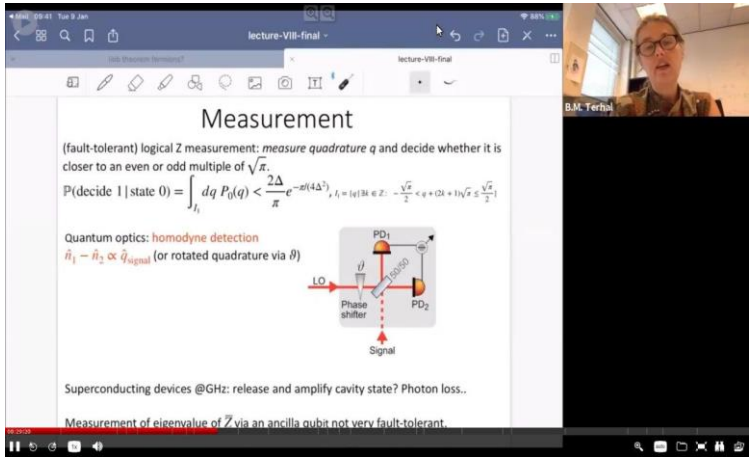
Quantum Measurement by D.P. DiVincenzo (RWTH)



- A 5 ECTS Elective Course at RWTH
- Type: Lectures, no exercises
- Assessment: Presentation of Project Work
- Course material uploaded in a Dropbox folder, and shared with students from Chalmers
- Course attended by 26 RWTH and 5 Chalmers students
- Chalmers students graded as passed / failed

Shared Courses in SoSe 2020 (2)

Quantum Error Correction by B.M. Terhal (TU Delft)



- Implemented as a 5 ECTS Elective course in RWTHonline
- Type: Lectures, weekly exercises
- Assessment: Exercise sheets + Presentation of Project Work
- Course material uploaded in RWTH Moodle for RWTH students and in Dropbox for Chalmers students
- Course attended by 10 RWTH, 6 Chalmers and 13 TU Delft students

Shared Courses in SoSe 2020 (2)

Quantum Error Correction by B.M. Terhal (TU Delft)

- Lectures / Exercises at TU Delft held on Tuesdays
- Recorded lectures viewed at RWTH on Fridays, assisted by teaching assistants at RWTH. Exercise sheets also corrected locally
- Chalmers students given the option to follow either schedule
- Credit difference between TU Delft and RWTH addressed with extra assignment
- Testimonials from RWTH students available on MyScore page

Distance Learning and Distance Assessment

- Timeline and Overview: Communication with Partner Universities
- Shared Courses in Summer Semester 2020
- Shared Courses in Winter Sememster 2020/21
- Challenges / Outlook

Shared Courses in Wise 2020/21 (1)

Quantum Optics by M. Müller (RWTH)

- A 5 ECTS elective course at RWTH
- Type: Lectures and Exercises
- Assessment: Oral Exam
- All partner-university students added to RWTH Moodle via RWTH partner coupons: No need for Dropbox
- Exercise sheets corrected by teaching assistants at RWTH
- Currently 6 Delft students and 30 RWTH students participating

Shared Courses in Wise 2020/21 (2)

Modelling of Superconducting Devices by B.M. Terhal (TU Delft)

- Implemented as a 5 ECTS elective course in RWTHonline
- Type: Lectures and Exercises (latter supported locally by TAs at RWTH)
- Extra assignment for RWTH students to address course-credit difference
- Assessment: Exercises + Presentation of Project Work
- Same schedule for ALL participants
- Course material uploaded in RWTH Moodle by TAs from RWTH: No need for Dropbox
- Course attended by 17 RWTH students and 14 TU Delft students

Shared Courses in Wise 2020/21 (3)

Quantum Computing by G. Ferrini (Chalmers)

- Implemented as an 8 ECTS elective course in RWTHonline
- Type: Lectures, Exercises, Programming Laboratory Exercise
- All RWTH and TU Delft students allowed access to **Canvas** (online platform used by Chalmers): No need for Dropbox
- Assessment: 2 Hand-ins + Written Exam (details for RWTH and TU Delft participants to be updated)
- Full support provided by teaching assistants at Chalmers
- Currently attended by 22 RWTH, 2 TU Delft and 25 Chalmers students

Shared Courses in RWTHonline

RWTHAACHEN UNIVERSITY RWTHonline Login

Curriculum / 88 128 Physics (HG-NRW/2013, Master programme, current)
Academic year 2020/21

Curriculum | Semester plan

Display | Node filter (All) | Academic year (2020/21)

+ Nanoelectronics			
− Quantum Technology			
+ [1320264] Advanced Quantum Electronics		5	3
+ [1323320] Groups and their Representation		5	2
+ [1323258] Modelling of Superconducting Devices (TU Delft)		5	3
+ [1323319] Path Integral Methods for Quantum Optics		5	3
+ [1323420] Quantum Computing (Chalmers University)		8	5
+ [1322706] Quantum Error Correction (TU Delft)		5	3
+ [1322704] Quantum Measurement		5	3
+ [1323558] Quantum Theory derived from Information Principles		5	3
+ [1323524] Selected Topics from Quantum Technology (Students Seminar)		10	2
+ [1322705] Spin Qubits		5	3
+ [1310619] Spinelectronics		5	3

Distance Learning and Distance Assessment

- Timeline and Overview: Communication with Partner Universities
- Shared Courses in Summer Semester 2020
- Shared Courses in Winter Sememster 2020/21
- Challenges / Outlook

Challenges / Outlook

- Common learning platform
  - Previously, addressed using Dropbox
  - Currently, external students allowed access to host university platforms
  - No solution yet
- Support for students
  - By host university? ⟹ Problematic if too many participants
  - By home university? ⟹ Not always possible to arrange
- Expanding the collaboration / areas
  - Other IDEA League partners / universities
  - Other study tracks

Thank you
for your attention!

For any queries, please contact

- Stefan Roth : studienberater@physik.rwth-aachen.de
- Paramita Dey : P.Dey@academy.rwth-aachen.de
- Anand Sharma : sharma@physik.rwth-aachen.de
- Thomas Radermacher: radermacher@physik.rwth-aachen.de