

COST Action PEARL PV CA16235  
Performance and Reliability of Photovoltaic Systems:  
Evaluations of Large-Scale Monitoring Data



## Training School IV

### Potential of monitoring tools, advanced operation and maintenance practice for security and predictability of PV performance

08 – 11 March 2022

Host: University of Twente, Enschede, The Netherlands

Final Programme

This will be a hybrid physical/on-line event due to the circumstances related to the control of Covid-19. On-line participation will be available for those who are unable to travel. Timings are based on Central European Time.

## Schedule of events

### Tuesday 08 March 2022 – Day 1 – Room T1300, Horst Building

Time	Activity	Lecturer
09:30-10:00	Registration and Opening of the Training School	Angèle Reinders / University of Twente Wilfried Van Sark/ Utrecht University, Copernicus Institute Jeffrey Kettle / University of Glasgow Cedric Caruana/ University of Malta Eli Shirazi / University of Twente
10:00-11:30	Participants introduction – training school participants introduce themselves and their research activities / team building	Chair: Cedric Caruana/ University of Malta
11:30-12:00	<i>Coffee break</i>	
12:00-13:00	Product development for PV performance control	Angèle Reinders / University of Twente
13:00-14:00	<i>Lunch break</i>	
14:00-15:00	Data monitoring & analytics for better PV performance and grid integration	Jonathan Leloux / Polytechnic University of Madrid, Spain
15:00-15:45	Fabrication of AI-BSF cells; assembly of crystalline-silicon-based modules	Jurriaan Schmitz / University of Twente
15:45-16:15	<i>Coffee break</i>	
16:15-17:00	PV reliability review	Jurriaan Schmitz / University of Twente

### Wednesday 09 March 2022 – Day 2 – Room T1300 Horst Building

Time	Activity	Lecturer
09:30-10:30	PV performance monitoring in a 100% renewable society	Wilfried Van Sark/ Utrecht University, Copernicus Institute
10:30-11:30	Understanding potential-induced degradation (PID) of photovoltaic (PV) modules	Mahmoud Dhimish / University of York, UK
11:30-12:00	<i>Coffee break</i>	
12:00-13:00	PV Module forensics and characterization of material degradation in the field	Gernot Orenski / Polymer Competence Center Leoben GmbH (PCCL)
13:00-14:00	<i>Lunch break</i>	
14:00-14:45	Excursion at University of Twente Campus – visit to PV plants and energy projects	Ray Klumpert / University of Twente, start at Linde Building
14:45-15:45		
15:45-16:15	<i>Coffee break</i>	
16:15-17:00	Workshop - explanation of the task Facilitated discussion	Cedric Caruana, Univ. Malta

### Thursday 10 March 2022 – Day 3 - Room T1300, Horst Building

Time	Activity	Lecturer
09:30-10:30	Monitoring system for floating solar	Sara Mirbagheri Golroodbari / Utrecht University, Copernicus Institute
10:30-11:30	Photovoltaic and Solar Forecasting	Eli Shirazi / University of Twente
11:30-12:00	<i>Coffee break</i>	
12:00-13:00	The role of digitalization in advanced operation and maintenance practices	Atse Louwen / EURAC Research
13:00-14:00	<i>Lunch break</i>	
14:00-14:15	Workshop - Group exercise	Cedric Caruana/ University of Malta Eli Shirazi / University of Twente
14:15-15:30	Workshop - Group exercise	Cedric Caruana/ University of Malta Eli Shirazi / University of Twente
15:30-16:00	<i>Coffee break</i>	
16:00-17:00	Workshop - Group exercise Preparation of group presentations for wrap-up session on Friday	Cedric Caruana/ University of Malta Eli Shirazi / University of Twente

## Friday 11 March 2022 – Day 4 Room W3, Waaier Building

Time	Activity	Lecturer
09:30–10:15	Preparation of group presentations for wrap-up session	Cedric Caruana/ University of Malta Eli Shirazi / University of Twente
10:15-11:00	Preparation of group presentations for wrap-up session	
11:00-11:30	Coffee break	
11:30-12:45	Interactive poster session and reports on task	Cedric Caruana/ University of Malta Angèle Reinders/University of Twente, Wilfried Van Sark/ University of Utrecht, Jeffrey Kettle / University of Glasgow Eli Shirazi / University of Twente
12:45-13:30	Wrap-up and closure of the training school/ joined lunch for on-site participants	Angèle Reinders / University of Twente, Wilfried Van Sark/ University of Utrecht, Jeffrey Kettle / University of Glasgow Cedric Caruana/ University of Malta

### Address of the venue:

University of Twente, Enschede, The Netherlands

### Contact persons:

Training School Manager: Prof. Dr. Aleksandra Krstic-Furundzic, University of Belgrade, at [akrstic@arh.bg.ac.rs](mailto:akrstic@arh.bg.ac.rs) or [akrsticfurundzic@gmail.com](mailto:akrsticfurundzic@gmail.com)

Training School Manager: Dr. Cedric Caruana, University of Malta, at [cedric.caruana@um.edu.mt](mailto:cedric.caruana@um.edu.mt)

### Local organizers:

Prof. Dr. Angèle Reinders / University of Twente, at [a.h.m.e.reinders@utwente.nl](mailto:a.h.m.e.reinders@utwente.nl)

Prof. Dr. Wilfried Van Sark/ University of Utrecht, Copernicus Institute, at [w.g.j.h.m.vansark@uu.nl](mailto:w.g.j.h.m.vansark@uu.nl)

Prof. Dr. Jeffrey Kettle / University of Glasgow, at [jeff.kettle@glasgow.ac.uk](mailto:jeff.kettle@glasgow.ac.uk)

Dr. Eli Shirazi / University of Twente, at [e.shirazi@utwente.nl](mailto:e.shirazi@utwente.nl)

### This Training School is supported by

