

# Monday

08:00 Registration

Session 1: Introduction  
Chairs: Toshimichi Otsubo, Daniel Hampf

08:45 Daniel Hampf Welcome and house-keeping  
09:15 Thomas Dekorsy Welcome by DLR and the Institute of Technical Physics  
09:35 Wolfgang Riede Overview of laser ranging activities at the Institute of Technical Physics

10:00 Coffee Break

10:30 Toshimichi Otsubo Opening remarks from GB Chair: Highlighting the significance of the workshop  
10:50 Carey Noll ILRS: Recent developments  
11:10 Matthew Wilkinson Next generation laser ranging systems  
11:30 John Degnan Possible Pathways to Producing Rapid Millimeter Accuracy Normal Points  
11:50 Georg Kirchner SLR in the next 7.5 years  
12:15 Discussion

12:30 - 14:00 Lunch

Session 2: Improving current station performance  
Chairs: Manuel Catalan, José Rodríguez, Jens Steinborn

14:00 Chairs Session presentation  
14:05 Krzysztof Sośnica Quality of Orbit Predictions for Satellites Tracked by SLR Stations 23800  
14:25 Sven Bauer Time Bias Service: Latest Status, Implementation and Prediction Quality Analysis 23820  
14:45 Marc Fernández Usón Copernicus Sentinel-3 Mission - Orbit Validation and SLR Station Quality Assessment 23789  
15:05 Van Husson An Independent Assessment of T2L2 Results from the NASA SLR Network 23827  
15:25 Stefan Riepl Statistical Evaluation of Simulated Normal Points Calculated with a Wiener Filter 23806

15:45 - 16:15 Coffee Break

16:15 Mourad Aimar INSAR Corner Cube at GRSM 23813  
16:35 Vyacheslav Ivanov Effects of Reference Frequency Stability to SLR Measurements Errors 23795  
16:55 Jake Griffiths Status of Laser Timing at Stafford, Virginia 23822  
17:15 Yuqiang Li Lunar Laser Ranging Research and Experiment in Yunnan Observatories 23802  
17:35 Chairs Poster presentations

17:45 Transponder Standing Committee  
Chair: Ulrich Schreiber

17:45 Welcome reception

## Tuesday

### Session 2: Improving current station performance Chairs: Manuel Catalan, José Rodriguez, Jens Steinborn

08:30	Herve Mariey	Two Way Ranging on Lunar Reconnaissance Orbiter at Grasse MEO station	23834
08:48	Tomasz Suchodolski	SRC PAS Borowiec Second Satellite Tracking System	23835
09:06	Georg Kirchner	Smart Transmit Telescope	23801
09:24	Ivan Prochazka	New SPAD Detector Package for SLR and Laser Time Transfer	23817
09:42	Andrey Sokolov	The Preliminary Results of Ground Tests Over the Ring Array	23811

10:00 - 10:30 Coffee Break

### Session 3: Synergies and new applications Chairs: Quirin Funke, Ulrich Schreiber, Daniele Dequal

10:30	Zhipeng Liang	Photometry with Gated SPAD: Theory and Approach	23781
10:50	Daniele Rovera	Time transfer accuracy	23821
11:10	Sergey Martynov	Time transfer through GLONASS: motivation, goals and technical implementation	---
11:30	Luca Calderaro	Towards quantum communication from global navigation satellite system	23786
11:50	Duy-Hà Phung	Laser Communication Experiments at Grasse - France Station (ID7845) and Prospective Applications of Satellite Laser Ranging	23790
12:10	Pengqi Gao	Fast Developing Space Debris Laser Tracking in China	23830

12:30 - 14:00 Lunch

14:00	Emiliano Cordelli	Use of a Night-Tracking Camera during daytime	23819
14:20	Nicolas Maurice	Fine tracking for laser flux stabilization on an optical detector for space-to-ground laser link communication	23780
14:40	David Lucchesi	LAGEOS and LARES satellites attitude determination with the LASSOS spin model	23772
15:00	Florian Dilssner	Benefits of SLR Tracking for Galileo Orbit and Attitude Determination	23823
15:20	Xiaoya Wang	Intra-technique Combination and Its Precision Evaluation based on SHAO SLR SINEX solutions	23771
15:40	Chairs	Discussion	

16:00 - 16:30 Coffee Break

### Space Debris Panel Chairs: Tim Flohrer, Georg Kirchner

16:30 - 17:30

18:00 Mission Standing Committee  
19:00 Network & Engineering Standing Committee

## Wednesday

### Session 4: Novel concepts to improve the SLR network Chairs: Michael Steindorfer, Zhang Zhongping, Andrey Sokolov

08:30	Michael Steindorfer	Daylight space debris laser ranging	
08:50	Kai Tang	Infrared Laser Ranging to Satellite and Debris in Shanghai station	23815
09:10	Mathis Bloßfeld	The potential of increased station performances for scientific SLR products	23774
09:30	Stefan Riepl	Improvements of the SOS-W automatic scheduler for special campaign support	23805
09:50	Daniel Hampf	The miniSLR system: a standardized solution for routine SLR observations	23773

### 10:10 - 10:40 Coffee Break

10:40	Xue Dong	GNSS Prediction from Navigation Message	23782
11:00	Evan Hoffman	SGSLR Receiver Validation and Pulse Width Amplitude Correction	23828
11:20	Jinsong Ping	Lunar surface control network with retro-reflectors and radio transponders in Chang'E lunar missions	23769
11:40	Jan Kodet	Coherent Time and Frequency Distribution System for a Fundamental Station	23778
12:00	Johann Eckl	Optical Laser time transfer and high repetition monostatic SLR	23779
12:20	Chairs	Discussion	

### 12:30 - 14:00 Lunch

### Poster session

14:00 Poster session

### 15:30 - 16:00 Coffee Break

### New applications panel Chairs: Evan Hoffman, Sven Bauer

16:00-17:00 New applications panel

### 17:30 Governing Board Chairs: Toshimichi Otsubo, Michael Pearlman

## Thursday

### Session 4: Novel concepts to improve the SLR network Chairs: Michael Steindorfer, Zhang Zhongping, Andrey Sokolov

08:30	Clément Courde	High repetition rate SLR at GRSM	23803
08:50	Daniele Dequal	100 kHz satellite laser ranging demonstration at Matera Laser Ranging Observatory	23775
09:10	Zhang Zhongping	Progress of Transportable Cabin-Based SLR system	23816
09:30	Takehiro Matsumoto	Status Report of Tanegashima SLR station (GMSL) and Developing status of JAXA's next SLR station	23776

9:50 - 10:20 Coffee Break

### Highlight Talk Chair: Michael Pearlman

10:20 - 11:20	Douglas Currie	On the Birth and Future of Lunar Laser Ranging
11:20	Daniel Hampf	SLR station excursion: Final announcements

11:30 - 13:00 Lunch

### SLR station technical tours

13:00 - 18:00 Tours incl. bus transfers

### Conference Dinner

19:00	Doors open
19:45	Dinner

## Friday

### Session 5: Safety & Security

Chairs: Jan McGarry, Jean-Marie Torre, Johann Eckl

09:00	Chairs	Introduction	
09:10	Jean-Marie Torre	European Laser Safety: Laser Emitters and Flight Safety	23824
09:30	Andreas Leidig	Free space laser safety system for Aircraft Camera Detection in the Infrared	23793
09:50	Matthew Wilkinson	Optically Detecting Aircraft for In-Sky Safety in Daylight Conditions	23810

### 10:10 - 10:40 Coffee Break

10:40	Toshimichi Otsubo	ADS ADS-B aircraft safety system assembled at less than EUR/USD 100	23777
11:00	Theodor Bachem	Web-based approach for system monitoring and remote SLR control	23809
11:20	Jan McGarry	SGSLR safety & security across global locations	23799
11:40	Chairs	Discussion	
12:00	Denise Beisecker	Poster Award Ceremony	

### 12:15 - 13:30 Lunch

### Session 6: Summary & Outlook

Chairs: Carey Noll, Michael Pearlman

13:30	Michael Pearlman	Introduction	
13:40	Michael Pearlman	SLR School Summary	
13:50	Otsubo et al	Session 1 Summary	
13:55	Catalan et al	Session 2 Summary	
14:00	Funke et al	Session 3 Summary	
14:05	Steindorfer et al	Session 4 Summary	
14:10	McGarry et al	Session 5 Summary	
14:15	Luceri / Pavlis	Analysis SC	
14:20	Schwadtke / Ricklefs	Data Formats and Procedures SC	
14:25	Merkowitz / Otsubo	Missions SC	
14:30	Wilkinson / Kirchner	Networks and Engineering SC	
14:35	Schreiber / Torre	Transponder SC	
14:40	Kirchner / Kucharski	Space Debris SC	

### 14:45 - 15:00 Coffee Break

15:00	Michael Pearlman	Workshop resolutions	
15:15	Toshimichi Otsubo	Future Workshops	
15:25	Yuqiang Li	22nd IWLR 2021 in Kunming	
15:35	Michael Pearlman	General discussion	

### 16:00 End of Workshop

## Posters

Session	Presenter	Title
Session 2	Stefanie Häusler	An SLR Receiver to Discriminate Single- from Multiphoton Events
Session 2	Mykhaylo Medvedskyy	Upgrade Hardware & Software Golosiiv Station 1824
Session 2	Thibaud Mourlon	Raspberry Pi-based Laser Beam Profiler
Session 2	Krzysztof Sońnica	Processing of Satellite Laser Ranging Data to GNSS Satellites at IGIG WUELS
Session 2	Manuel Sánchez Piedra	San Fernando Laser Station Updates and New Improvements
Session 2	Jie Zhang	The Performance of 1m Aperture SLR Telescope in Wuhan JiuFeng SLR Station
Session 2	Jorge del Pino	Continuous Sky Clarity Monitoring at Riga and Metsähovi: January 2018 - June 2019
Session 2	Ignatenko I.Yu.	Accuracy of Single Measurements in a Laser Location
Session 2	Andrey Sokolov	An Array of Compact Cheap CCRs for High-elliptical Navigation Spacecraft
Session 2	Erik Günther	All Sky Camera Concept
Session 2	Rongwang Li	Mount model of 1.2m telescope at Kunming station
Session 2	Julie Horvath	Status of the NASA SGSLR Subsystem Development
Session 3	Ingrid Fausk	Where – a new software for geodetic analysis
Session 3	Krzysztof Sońnica	Realization of the terrestrial reference frame based on integrated SLR measurements to LEO, geodetic, and Galileo satellites
Session 3	Pengqi Gao	Space Debris Laser Ranging and Characteristic Analysis
Session 3	Pengqi Gao	Weak Echo Signal Extraction in Space Debris Laser Ranging
Session 3	Nils Bartels	Design and qualification of a recessed satellite cornercube retroreflector for ground-based attitude verification via satellite laser ranging
Session 3	Ivan Prochazka	New photon counting detector packages optimized for space debris tracking and near infrared operation
Session 3	Kai Tang	Progress of laser time transfer on Chinese Space Station
Session 4	Dennis Chase	Using Problem Reports and LORs in the Sustainment of NASA SLR Networks
Session 4	Alexander DeRieux	A Python-based Analysis Toolkit for SLR Ground Stations
Session 4	Rivers Lamb	Application of Adult Stage Development Theory to the Management of the NASA SLR Operations Team
Session 4	José Antonio López Pérez	YLARA station development status 2019
Session 4	Efim Tcyba	Determination of Precise EOP using Satellite and Lunar Laser Ranging
Session 4	Peiyuan Wang	Contributions to sub-MHz SLR in Graz
Session 4	Gerd Wagner	MS-LART: DLR's latest telescope platform for satellite and space debris laser ranging
Session 4	Mateusz Drożdżewski	Troposphere delay modeling in SLRsolutions
Session 4	Christopher Clarke	SGSLR Receiver Detector Pulse Width Calibration Technique
Session 5	Howard Donovan	NASA SGSLR Power and Lightning Protection