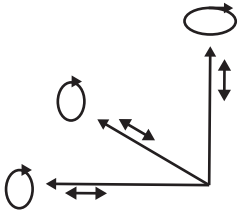
Sun Moon Lake, Taiwan

September 22nd-26th, 2019

5th International Working Group on Rotational Seismology



Host

Institute of Earth Sciences, Academia Sinica

Sponsors

Taiwan Earthquake Research Center

Chinese Taipei Geophysical Society

Ministry of Science and Technology

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CONTENTS

General Information

Conference Venue

The conference will be held at the Conference Center of Sun Moon Lake Teachers' Hostel. (Address : No.136, Zhongxing Rd., Yuchi Township, Nantou County 555, Taiwan)

Guideline for Presenters

The presentation time for the Keynote speakers is 30 minutes each, general speakers is 15 minutes each.

Guideline for Posters

Poster size: 175cm(height)*85cm(width).

Meals

During the conference, all meals will be served to the participants.

Ice Breaker

The Ice breaker of IWGoRS 5th will take place at Conference Center, Sun Moon Lake Teachers' Hostel from 16:00 of Sunday, 22 September, 2019. Registration desk will open there from 16:00 to 17:30.

Banquet

All participants are invited to join the IWGoRS 5th Banquet held at 19:30 on 23 September, 2019. Shuttle bus will wait at 19:00 in front of Yin-Bin building, Lobby. (Fleur De Chine Hotel, Address: CRIMSON, 2F No.23, Zhongzheng Road, Sun Moon Lake, Yuchi Township, Nantou County 55546, Taiwan)

Free Wi-Fi

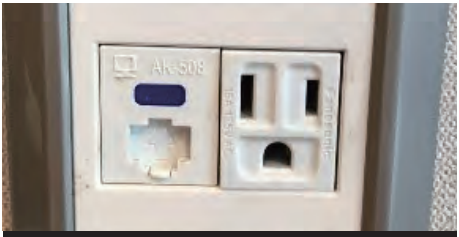
The Conference Center Wi-Fi account number and password can be obtained at registration desk.

Field Trip

Following the 2 days sessions at Sun Moon Lake Teachers' Hostel, a one-day field trip is organized to visit Shihkang Dam, 921 Earthquake Museum of Taiwan and Chelungpu Fault Presservation Park.

AC Power Socket

Hotel provides two kinds of power sockets.



Sockets A : 110V

Sockets B : 220V

Recreation Area

First floor of Bai-Ru building.

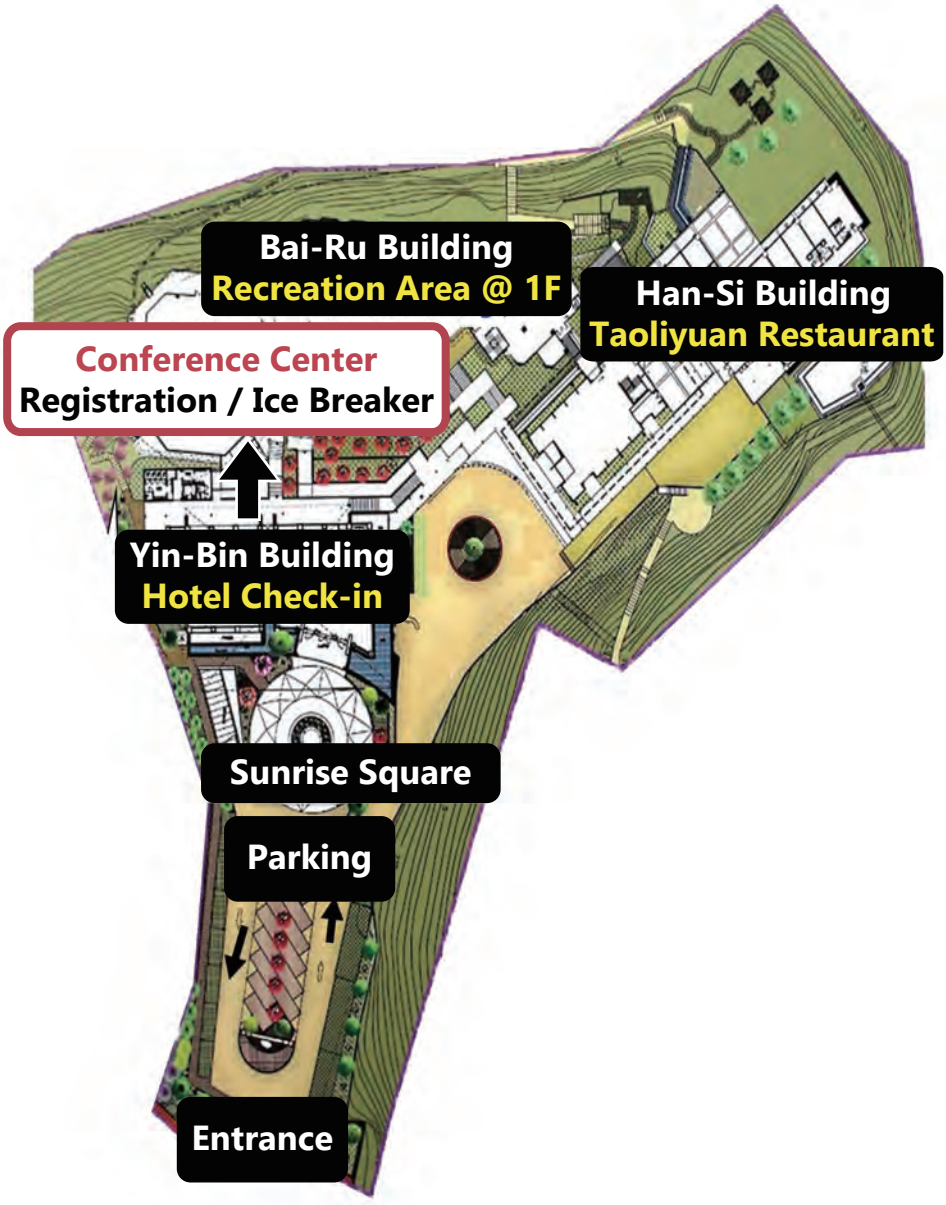
Laundry Facilities

Both washer & dryer machine cost NT$40/once which are located at recreation area in the first floor of Bai-Ru building.

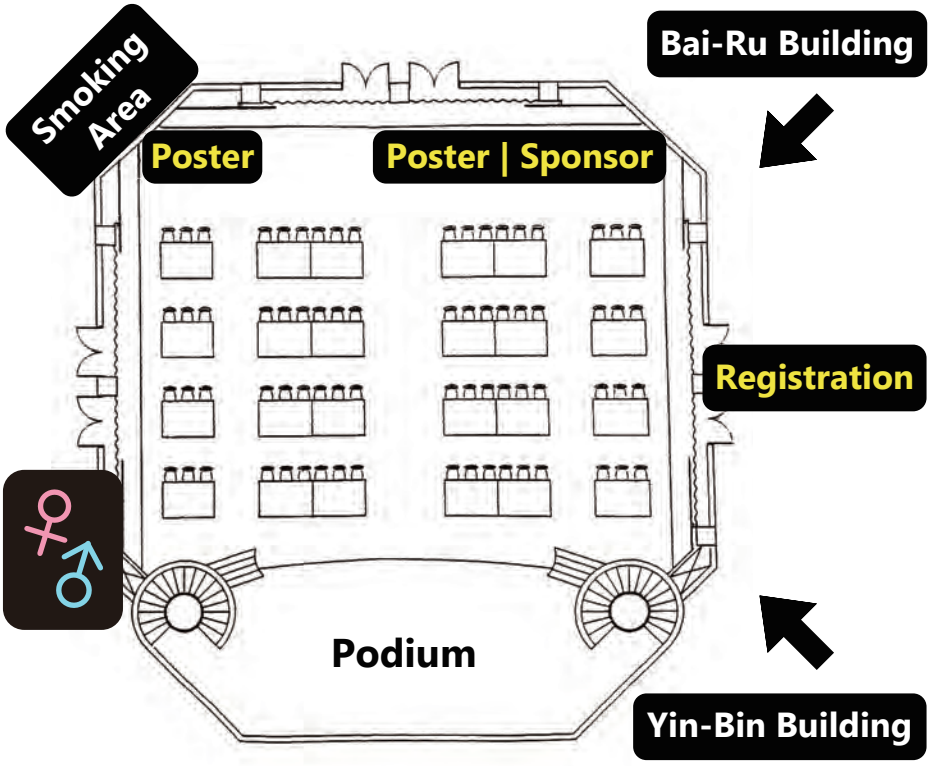
Emergency Contact

Dr. Chin-Jen Lin : +886-919520107
Dr. Bor-Shouh Huang : +886-920802331

Sun Moon Lake Teachers' Hostel
Symposium Floor Plan



Conference Center Floor Plan



Quick Reference

	9/22 Sun.	9/23 Mon.	9/24 Tue.	9/25 Wed.	9/26 Thu.
08:00		Opening (08:50)		Field Trips	
09:00		Taiwan's role in rotation seismology	Structure		Array
10:40		Break			Final Discussion
11:00		ROMY progress	Theory		Check out & Lunch box & Farewell
12:00		Lunch			
13:30		Data analysis	Instrument I		
15:00		Break			
15:30		Planetary, volcano	Instrument II		
16:00	Registration & Ice breaker	Poster	Poster		
16:45					
17:00					
17:30			Dinner		
19:00		Shuttle bus at Lobby			
19:30		Banquet			

Conference Program

9/23 Monday

Time	Title	Speaker
08:50-09:00	Opening	Heiner Igel
TOPIC 1 : Taiwan's role in rotation seismology **Convener : Wen-Tzong Liang**		
09:00-09:30	Review of Rotation Seismology Research in Taiwan	Bor-Shouh Huang
09:30-10:00	Source Parameters of 2018 Mw6.4 Hualien, Taiwan, Earthquake Derived from Nanao Array: A Field Test of a 6 DOF Observation Facility	Wu-Cheng Chi
10:00-10:30	What do we learn from near field 6C recording of 2018 Mw6.4 Hualien Earthquake	Kuo-Fong Ma
10:30-10:40	Discussion	
10:40-11:00	Coffee Break	
TOPIC 2 : ROMY progress **Convener : Heiner Igel**		
11:00-11:30	The ROMY project: A 4-component ring laser for geophysics and geodesy	Heiner Igel (Invited Speaker)
11:30-11:45	Sensor orientation and perimeter stabilisation of the ROMY installation	André Gebauer
11:45-12:00	Discussion	
12:00-13:30	Lunch	
TOPIC 3 : Data analysis **Convener : Vladimir Graizer**		
13:30-14:00	Land-atmosphere interactions in the low-frequency seismic band and inversion for shallow elasticity structure	Toshiro Tanimoto (Invited Speaker)
14:00-14:15	Determine phase velocity and wave field azimuth of surface wave from joint analysis of seismograph and ground rotation	Chin-Jen Lin
14:15-14:30	DEFORMATIONS AND ROTATIONAL MOTIONS EXTRACTED FROM DOWNHOLE ARRAY RECORDINGS	Vladimir Graizer
14:30-15:00	Six-degree-of-freedom seismogeodesy by combining high-rate GNSS, accelerometers and gyroscopes	Jianghui Geng (Invited Speaker)
15:00-15:15	Discussion	
15:15-15:45	Coffee Break	
TOPIC 4 : Planetary, volcano **Convener : Felix Bernauer**		
15:45-16:00	PIONEERS H2020-SPACE European project: 6DoF ground motion sensors for planets and asteroids	Felix Bernauer
16:00-16:15	Volcanic eruption and ground rotational motion	Minoru Takeo
16:15-16:30	6C Recordings at Active Volcanoes	Joachim Wassermann
16:30-16:45	Discussion	
16:45-19:00	Poster (posters stay until end of workshop)	
19:00	Shttle bus at Lobby (Yin-Bin building)	
19:30	Banquet	

9 / 24 Tuesday

Time	Title	Speaker
TOPIC 5 : Structure **Convener : Zbigniew Zembaty**		
09:00-09:30	Rotation in buildings during earthquake loading: comparison of rotation and structural drift	Philippe Guéguen (Invited Speaker)
09:30-09:45	Testing accelerometer, GNSS and rotation sensors for strong ground motions on an industrial robot arm	Yara Rossi
09:45-10:00	Testing rotation rate sensors in structural health monitoring	Zbigniew Zembaty
10:00-10:15	6-dof strong surface seismic record of MM intensity VII and its effect on a slender tower and tall buildings	Piotr Bońkowski
10:15-10:30	Application of dynamic tilt correction with direct measurements of rotation	Felix Bernauer
10:30-10:40	Discussion	
10:40-11:00	Coffee Break	
TOPIC 6 : Theory **Convener : Krzysztof Teisseyre**		
11:00-11:15	The phase fields concept – qualitative discussion	Krzysztof Teisseyre
11:15-11:30	Seismic Response of reduced micropolar elastic half-space	Mohammad Atif
11:30-11:45	Seismic wave propagation in Layered Reduced Micropolar Half-space	Raghukanth Stg
11:45-12:00	Discussion	
12:00-13:30	Lunch	
TOPIC 7 : Instrument I **convener : Johana Brokesova**		
13:30-14:00	Progress in high resolution Sagnac Interferometry	Ulrich Schreiber (Invited Speaker)
14:00-14:15	Rotational ground motion instrumentation: blueSeis continues its quest for innovation	Frédéric Guattari
14:15-14:30	Improving of signal-to-noise ratio by nonlinear stacking of six-component seismograms	Johana Brokesova
14:30-14:45	A high sensitivity giant dual-polarization fiber optic gyroscope for rotational seismology	Yuwen Cao
14:45-15:00	Discussion	
15:00-15:30	Coffee Break	
TOPIC 8 : Instrument II **convener : Jianghui Geng**		
15:30-15:45	Experimental perspectives for rotational seismology – construction of optical fiber sensors set	Anna Kurzych
15:45-16:00	Principles of a single inertial mass 6-DOF accelerometer	Nick Bernitsas
16:00-16:15	Detection of rotation and strain with no common time-moments	Krzysztof Teisseyre
16:15-16:30	Discussion	
16:30-17:30	Poster (posters stay until end of workshop)	
17:30	Dinner	

9/26 Thursday

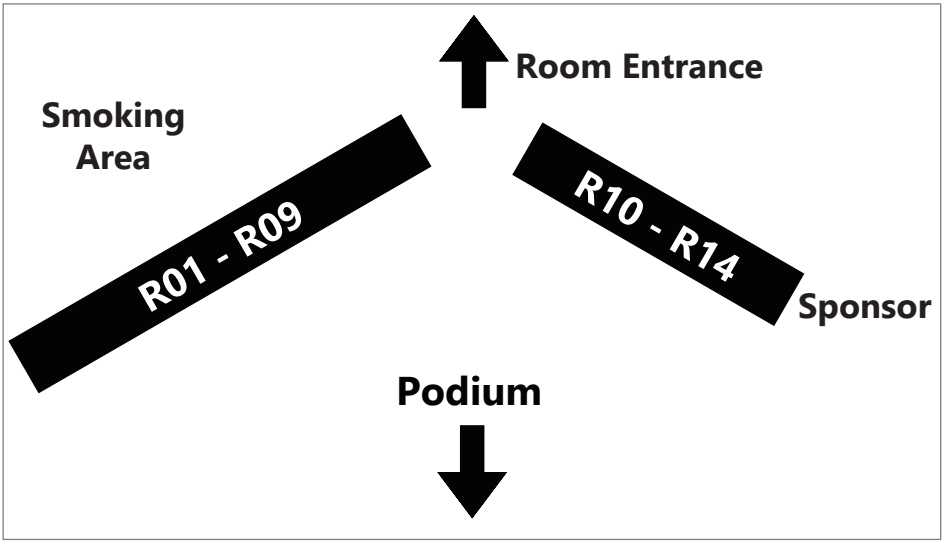
Time	Title	Speaker
TOPIC 9 : Array **Convener : Nori Nakata**		
09:00-09:30	Characterization of earthquake ground motion and ambient-noise correlation using a rotational seismometer and an array-based rotational motion	Nori Nakata (Invited Speaker)
09:30-10:00	Rotational motion and spatial wavefield gradient data in seismic exploration – a review	Cedric Schmelzbach (Invited Speaker)
10:00-10:15	Uncertainty quantification in rotational seismology	Roxanne Rusch
10:15-11:00	Final Discussion	
11:00	Check out & Lunch box & Farewell	

Poster

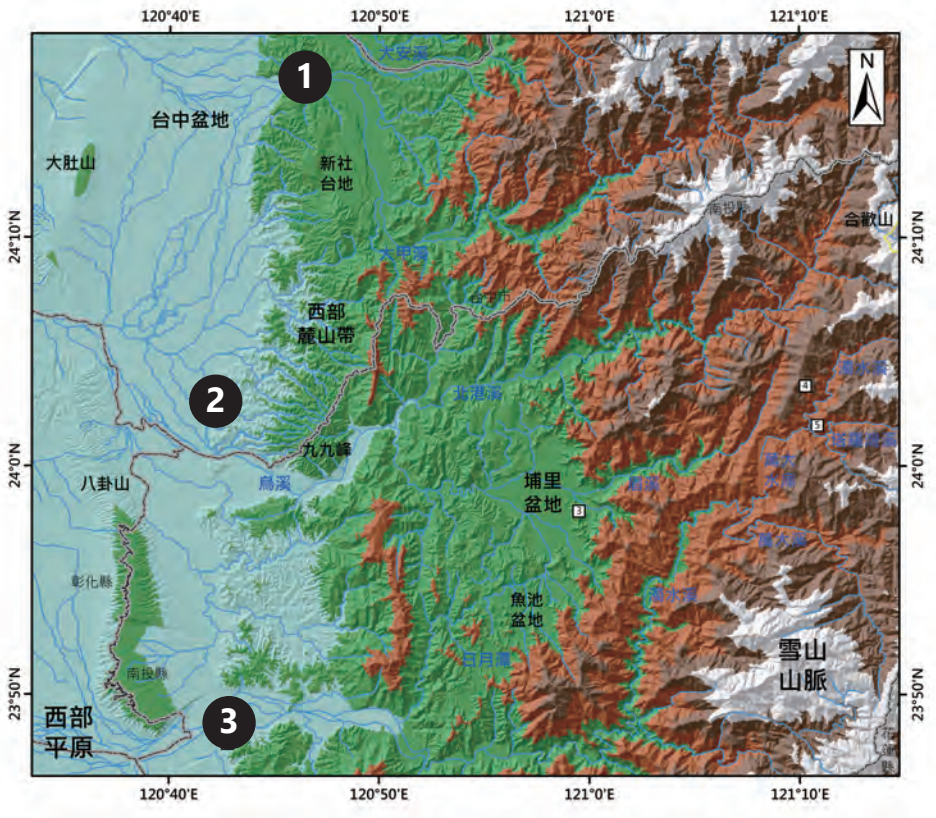
NO.	Name	Affiliation	Title
R01	Chu-Fang Yang	Taiwan International Graduate Program, Academia Sinica and National Central University	Seismically detected ground tilts induced by precipitation and fluvial processes: Examples from Taiwan
R02	Celine Hadziioannou	University of Hamburg	Investigating seismic background noise with six degrees of freedom ground motion measurements
R03	Chang Chen	China University of Geosciences,Beijing	Comparisons of Travelling-Wave Method and Difference Method for Calculating Rotational Components
R04	Dong-qing Li	China University of Geosciences(Beijing)	Calculating Rotational Ground Motions by Finite Difference Method
R05	Lixia Sun	China University of Geosciences, Beijing	3D 6C elastic wave simulation
R06	Shihao Yuan	Ludwig Maximilian University of Munich	Six degrees of freedom analysis of point ground motions: application to G-ring and ROMY data
R07	Shihao Yuan	Ludwig Maximilian University of Munich	Fracture characterization from walkaround VSP in the presence of 6C sensors
R08	Shihao Yuan	Ludwig Maximilian University of Munich	Six degree-of-freedom broadband ground motion observations with portable sensors: validation, local earthquakes, signal processing
R09	Shihao Yuan	Ludwig Maximilian University of Munich	Rupture Tracking with 6 DoF Ground Motion Observations: A Synthetic Study

NO.	Name	Affiliation	Title
R10	Roxanne Rusch	CEA, DAM, DIF, F-91297 Arpajon, France	Exploration of the relations between seismic source moment tensor and seismic rotations.
R11	Michal Dudek	Military University of Technology	Near-field rotations excited by the microblast-method excavations
R12	Xinming Qiu	China University of Geosciences, Beijing	Numerical characteristics of surface waves on 3D6C records
R13	Stefanie Donner	BGR Hannover	Seismic point and kinematic source solutions from rotational ground motion
R14	Jiri Malek	IRSM CAS	New prototype of 6-component seismograph Rotaphone CY: laboratory testing and pilot measurements

Poster Display



Field Guide

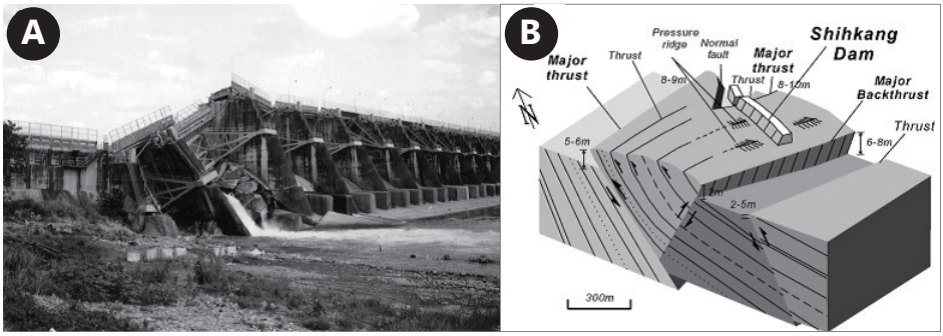


1. **Shihkang Dam**
2. **921 Earthquake Museum of Taiwan**
3. **Chelungpu Fault Presservation Park**

Shihkang Dam

In Shihkang District of Taichung City, a system of multiple thrusts and a major backthrust slipped during the earthquake. First, to the north of Shihkang in the Tachia River, two thrust faults ruptured across the northern part of the Shihkang Dam. A major thrust, linked to the main thrust at the Pifeng Bridge to the west, exhibited a large vertical displacemenet of 8-10m (according to the offset of the dam crest).

The Shihkang Dam is located at the bottom of a triangular zone, of which two edges were formed by a major thrust and a backthrust (Lee et al., 2002). The thrust and the backthrust extend to the south of the Pifeng Bridge area and gradually increase in displacement on both sides of the Shihkang Dam. At least two major thrusts have been found to be closely associated with the destruction of the dam (Chen et al., 2001). The N-S trending main body of the dam was deformed to a gentle anticline. This N-S to NNW-SSE compression was also reflected by a series of pressure ridges at the foot of the dam.



Shihkang Dam deformation and Fault system (after Lee et al., 2002).

A Photograph of the Shihkang Dam showing the breaks of the dam body with a vertical offset of 8–10 meters.

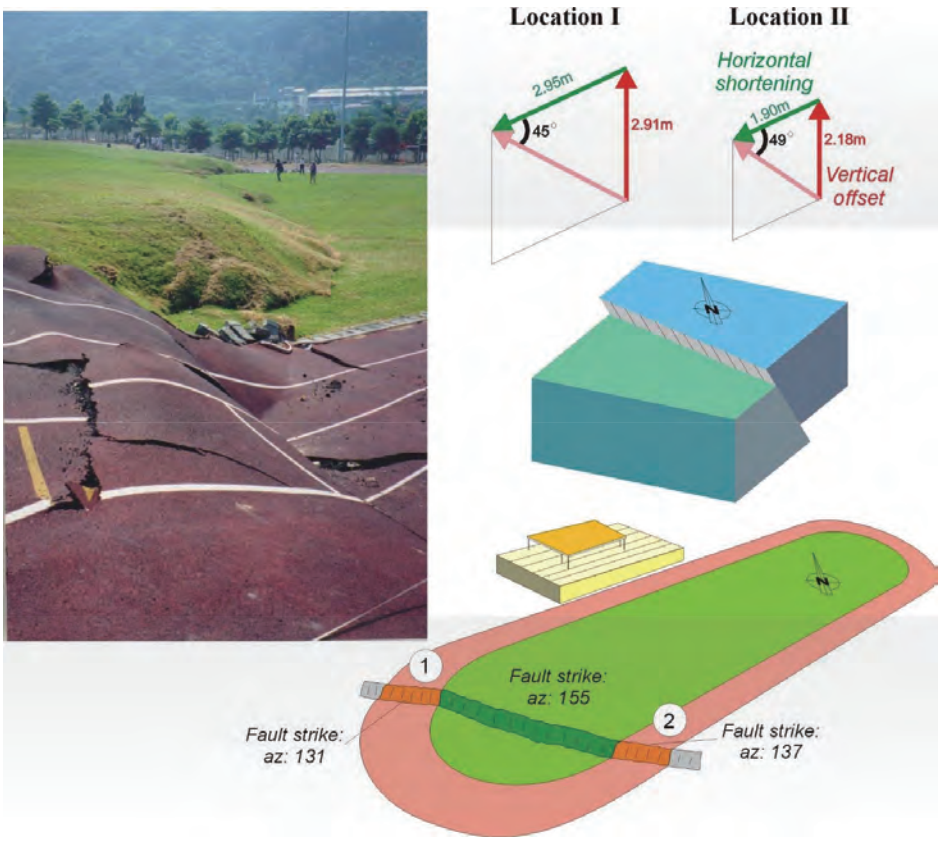
B A 3D block-diagram of the deformation in the Shihkang Dam area. The Shihkang Dam is located on the pop-up fold lifted by thrust and backthrust. At least two thrusts situated on the northern end of the dam have broken the dam. The rest of the dam body has been folded and several different scales of pressure ridges can be observed along the foot of the dam.

921 Earthquake Museum of Taiwan

The segment of the Chelungpu Fault scarp across the Kuang-Fu stadium is about 100 m long and trends NW-SE. To the NW, the scarp cuts across the western half-ellipse of the stadium.

This sub-segment is 12 m long and strikes N125°–130°E, almost perpendicular to the run tracks. Because of their elliptic shape, the tracks trend approximately N40°E on the hangingwall and N20° on the footwall. To the SE, the scarp cuts across the southern straight line of the stadium. This sub-segment is 18 m long and strikes N125°–135°E, oblique at an angle of about 45° to the run tracks. The tracks are rectilinear and trend N86°E on both sides of the rupture zone. Between the two sub-segments, the scarp runs across the central pool of the stadium; it is approximately 70 m long and strikes N152°E on average.

The local fault strikes vary because the shape of the scarp was influenced by the mechanical response of the surface layers, including the stadium track cover. These local strikes do not reflect the fault geometry at depth, even at the 100 m scale considered. The average trend of the whole fault segment of the Kuang-Fu stadium, N141°E, is considered as the local strike of the Chelungpu Fault.



The earthquake fault formed a 2-m high thrust scarp and cut through the sport stadium. The lines on the running tracks allow measuring the displacements of the fault in 3 dimensions. Note that the strike of the surface fault changed because of the different mechanical properties of surface materials. The reconstructed fault geometry shows a reverse fault with a fault plane dipping 45°–50° to the east.

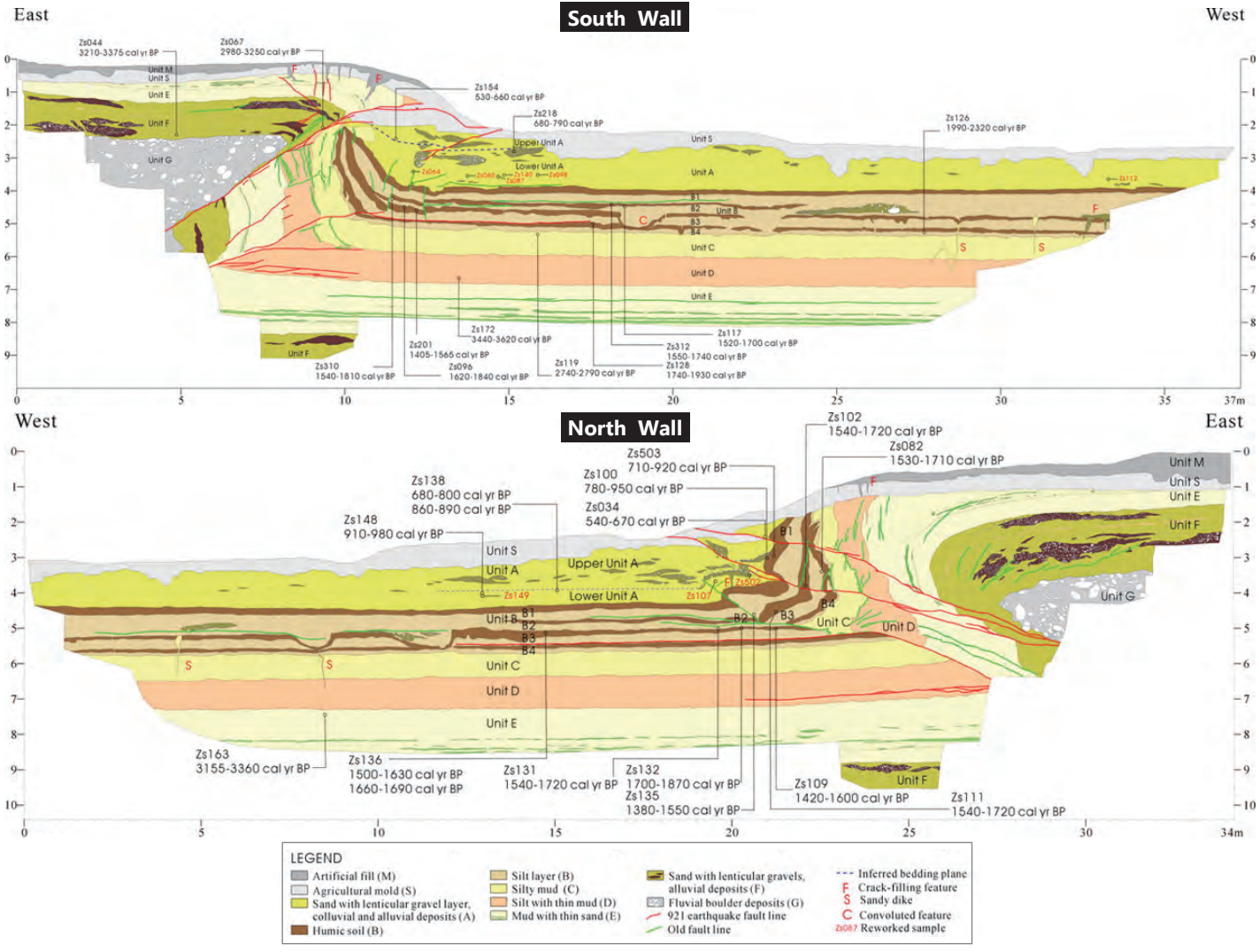
Chelungpu Fault Presservation Park

Following the devastating Chi-Chi Earthquake, intense Paleoseismological investigations have been carried out on the Chelungpu Fault and other active faults around Taiwan. The Zhushan Trench is one of the major research efforts and the Chelungpu Fault Preservation Park hosts the restored research trench dug in 2002 (by group led by Prof. W.-S. Chen of NTU) at Zhushan Township, Nantou County.

The park is managed and part of the National Museum of Natural Science, and is the result of huge joint efforts between the academics and government for education, research, and hazard mitigation on the Chi-Chi Earthquake, and geohazard as well as Taiwan geology in general. Guided visit is arranged.

Clear fault and fold structures are revealed on the trench walls, as well as key properties and faulting history of the Chelungpu Fault as summarized in Chen et al. (2007). The trench was later preserved and open to public as science education museum in the joint venture of Ministry of Education and National Museum of Natural Sciences. Based on paleoseismological results of the Zhushan Trench, 5 major paleoearthquakes ruptured the same site during the past 2000 years with an averaged uplift rate no less than 4 mm/yr (Chen et al., 2007).

The results are briefed in the following figures:


South Wall
East
West
Zs044
3210-3375 cal yr BP
Zs067
2980-3250 cal yr BP
Zs154
530-660 cal yr BP
Zs218
680-790 cal yr BP
Zs126
1990-2320 cal yr BP
Unit M
Unit S
Unit E
Unit F
Unit G
Upper Unit A
Lower Unit A
Unit A
Unit B
Unit C
Unit D
Unit E
B1
B2
B3
B4
Zs064
Zs066
Zs140
Zs098
Zs112
Zs172
3440-3620 cal yr BP
Zs201
1405-1565 cal yr BP
Zs310
1540-1810 cal yr BP
Zs096
1620-1840 cal yr BP
Zs119
2740-2790 cal yr BP
Zs312
1550-1740 cal yr BP
Zs128
1740-1930 cal yr BP
Zs117
1520-1700 cal yr BP
0
5
10
15
20
25
30
35
37m
North Wall
West
East
Zs102
1540-1720 cal yr BP
Zs082
1530-1710 cal yr BP
Zs503
710-920 cal yr BP
Zs100
780-950 cal yr BP
Zs034
540-670 cal yr BP
Zs138
680-800 cal yr BP
860-890 cal yr BP
Zs148
910-980 cal yr BP
Unit M
Unit S
Unit E
Unit F
Unit G
Unit A
Upper Unit A
Lower Unit A
Unit B
Unit C
Unit D
Unit E
B1
B2
B3
B4
Zs149
Zs107
Zs163
3155-3360 cal yr BP
Zs136
1500-1630 cal yr BP
1660-1690 cal yr BP
Zs131
1540-1720 cal yr BP
Zs132
1700-1870 cal yr BP
Zs135
1380-1550 cal yr BP
Zs109
1420-1600 cal yr BP
Zs111
1540-1720 cal yr BP
0
5
10
15
20
25
30
34m
LEGEND
Artificial fill (M)
Agricultural mold (S)
Sand with lenticular gravel layer, colluvial and alluvial deposits (A)
Humic soil (B)
Silt layer (B)
Silty mud (C)
Silt with thin mud (D)
Mud with thin sand (E)
Sand with lenticular gravels, alluvial deposits (F)
Fluvial boulder deposits (G)
921 earthquake fault line
Old fault line
Inferred bedding plane
F Crack-filling feature
S Sandy dike
C Convoluted feature
Zs087 Reworked sample

Logs of the trench walls with the radiocarbon dates and the earthquake faults (red: Chi-Chi ruptures; green: previous ruptures) (Chen et al.,2007).

References

Chen, W.-S., B.-S. Huang, Y.-G. Chen, Y.-H. Lee, C.-N. Yang, C.-H. Lo, H.-C. Chang, Q.-C. Sung, N.-W. Huang, C.-C. Lin, S.-H. Sung and K.-J. Lee, 2001. 1999 Chi-Chi Earthquake: A Case Study on the Role of Thrust-Ramp Structures for Generating Earthquakes. Bulletin of the Seismological Society of America 91(5), 986–994.

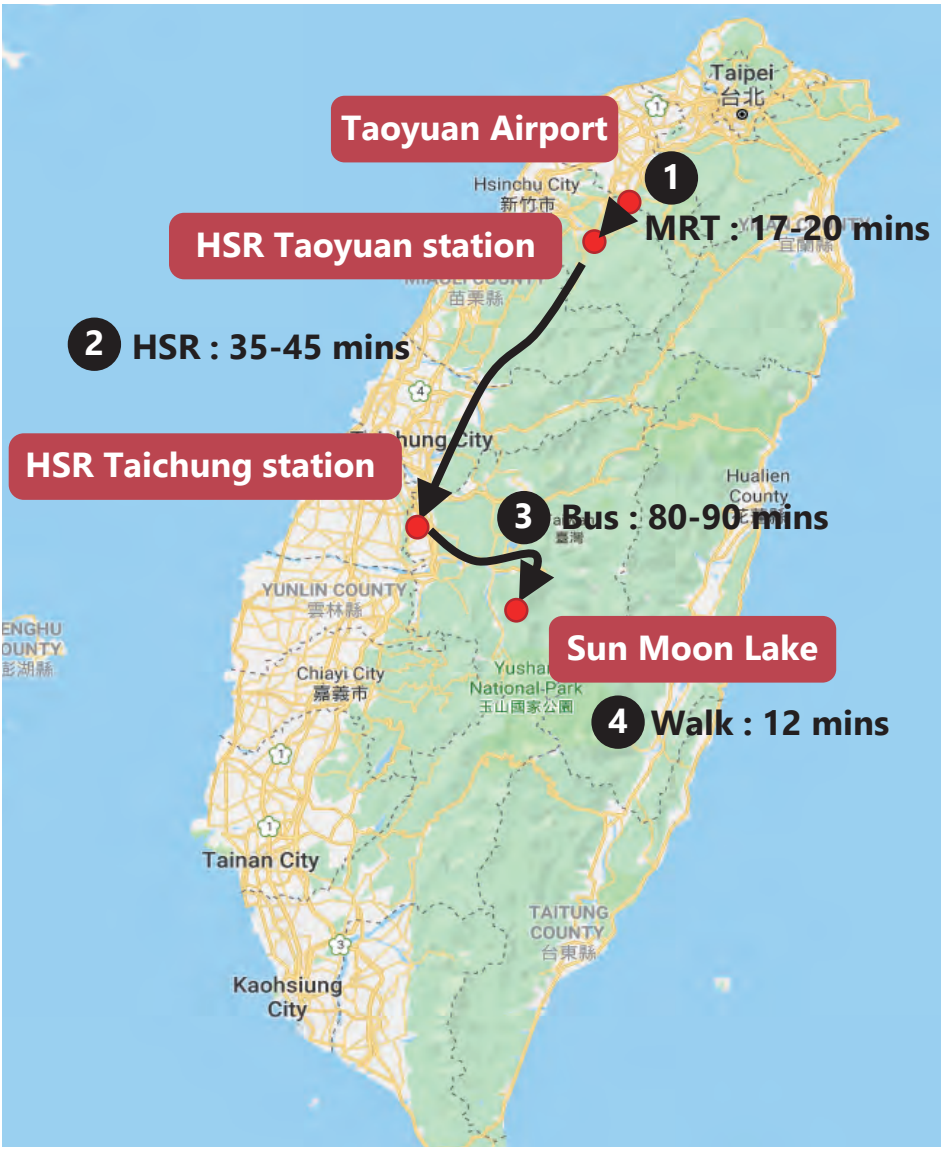
Chen, W.-S., C.-C. Yang, I-C. Yen, L.-S. Lee, K.-J. Lee, H.-C. Yang, H.-C. Chang, Y. Ota, C.-W. Lin, W.-H. Lin, T.-S. Shih, S.-T. Lu, 2007. Late Holocene Paleoseismicity of the Southern Part of the Chelungpu Fault in Central Taiwan: Evidence from the Chushan Excavation Site. Bulletin of the Seismological Society of America 97(1), 1–13.

Lee, J.-C., H.-T. Chu, J. Angelier, Y.-C. Chan, J.-C. Hu, C.-Y. Lu, R.-J. Rau, 2002. Geometry and structure of northern surface ruptures of the 1999 Mw 7.6 Chi-Chi, Taiwan earthquake: influence from inherited fold belt structures. J. Struct. Geol. 24, 173–192.

Sun Moon Lake Travel Guide

Transportation

Route Map



1 Taoyuan MRT → HSR Taoyuan Station

NT$25

A12 (T1) / A13 (T2) → A18 (Taoyuan HSR)
It takes about 20 mins, every 15 minutes per train.

Taoyuan MRT: +886-3-2688789
(Business hours: 06:00 - 24:00)

Route Map

Click to Link

2 HSR Taoyuan Station → Taichung Station

Standard Seats	NT$540
Business Seats	NT$1,010
Non Reserved Seats	NT$520

Timetable Ticket Price

Click to Link

Note: We do not suggest participant reserving HSR ticket in advanced. (With flight arrival it s often hard to estimate the exact time) Taiwan HSR is really convenient and flexible. There are two kinds of ticket: reserved and non-reserved. Taking non-reserved ticket you could go into non-reserved cabin (the latest three cabins) at any train on the same day. If you buy the reserved ticket but miss the train, this ticket can still be used in non-reserved cabin at other trains on the same day.

HSR Taoyuan Station: +886-3-2612000
(Business hours: 07:00 - 23:45)

3 HSR Taichung Station → Sun Moon Lake Bus Station

No. 6670 Nantou Bus	One Way	NT$195
	Round Trip	NT$360

Bus ticket booth (with bus stop) can be found at Exit 5 on the first floor (HSR ticket platform is on the second floor). It takes about 90 mins, every 30 mins per bus.

The Sun Moon Lake bus stop is in front of the Shueishe Visitors Center. Return stop is next to the police station.

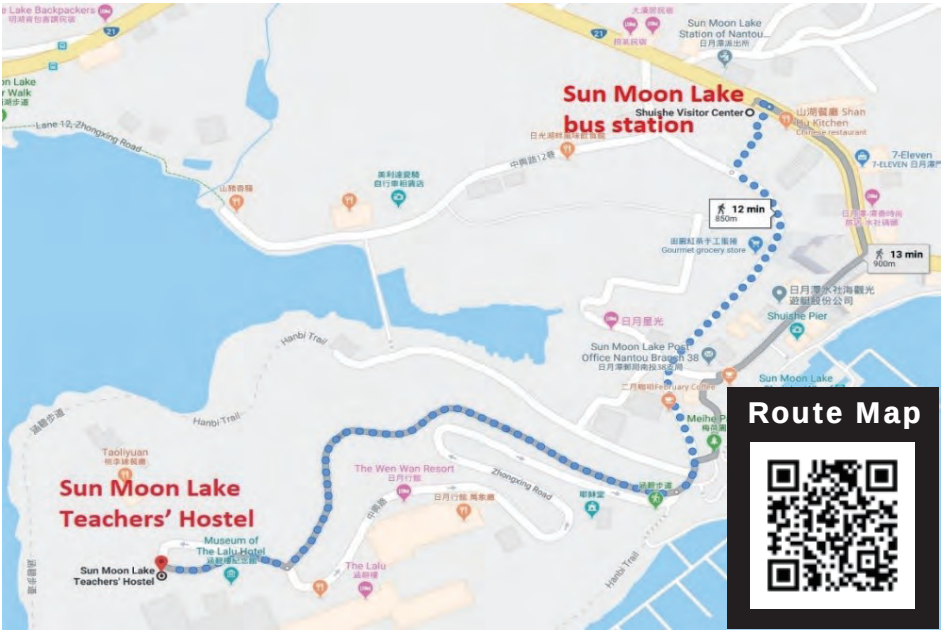
Timetable Ticket Price

Click to Link

Taichung station: +886-4-36018665
(Business hours: 07:30 - 18:00)

4 Sun Moon Lake Bus Station → Sun Moon Lake Teachers' Hostel

It takes about 12 mins by walk.



Click to Link

Appendix A.

Taoyuan Airport MRT Route Map

Appendix B1. HSR Timetable

HSR Taoyuan station → HSR Taichung Station

No.	ETD → ETA
0621	10:10 - 10:46 (00:36)
1309	10:20 - 10:52 (00:32)
0817	10:34 - 11:15 (00:41)
0625	10:43 - 11:23 (00:40)
0627	11:10 - 11:46 (00:36)
0821	11:34 - 12:15 (00:41)
1631	11:43 - 12:23 (00:40)
0633	12:10 - 12:46 (00:36)
0825	12:34 - 13:15 (00:41)
0639	13:10 - 13:46 (00:36)
0829	13:34 - 14:15 (00:41)
1643	13:43 - 14:23 (00:40)
0645	14:10 - 14:46 (00:36)
0833	14:34 - 15:15 (00:41)
1649	14:43 - 15:23 (00:40)
0651	15:10 - 15:46 (00:36)
0837	15:34 - 16:15 (00:41)
1655	15:43 - 16:23 (00:40)
0657	16:10 - 16:46 (00:36)
0841	16:34 - 17:15 (00:41)

No.	ETD → ETA
0661	16:43 - 17:23 (00:40)
0663	17:10 - 17:46 (00:36)
0845	17:34 - 18:15 (00:41)
0667	17:43 - 18:23 (00:40)
0669	18:10 - 18:46 (00:36)
0849	18:34 - 19:15 (00:41)
0673	18:43 - 19:23 (00:40)
0675	19:10 - 19:46 (00:36)
0853	19:34 - 20:15 (00:41)
1679	19:43 - 20:23 (00:40)
0681	20:10 - 20:46 (00:36)
0857	20:34 - 21:15 (00:41)
1685	20:43 - 21:23 (00:40)
0687	21:10 - 21:46 (00:36)
0861	21:34 - 22:15 (00:41)
0693	22:05 - 22:41 (00:36)
0333	22:15 - 22:47 (00:32)
0295	22:35 - 23:05 (00:30)
0565	22:48 - 23:29 (00:41)
0567	23:21 - 23:59 (00:38)

Appendix B1. HSR Timetable

HSR Taichung Station → HSR Taoyuan station

No.	ETD → ETA
0606	08:00 - 08:36 (00:36)
1514	08:04 - 08:49 (00:45)
0610	08:32 - 09:09 (00:37)
0806	08:36 - 09:18 (00:42)
0612	09:00 - 09:36 (00:36)
0616	09:32 - 10:09 (00:37)
0810	09:36 - 10:18 (00:42)
0618	10:00 - 10:36 (00:36)
0814	10:36 - 11:18 (00:42)
0624	11:00 - 11:36 (00:36)
0628	11:32 - 12:09 (00:37)
0818	11:36 - 12:18 (00:42)
0630	12:00 - 12:36 (00:36)
0822	12:36 - 13:18 (00:42)
0636	13:00 - 13:36 (00:36)
0826	13:36 - 14:18 (00:42)
0642	14:00 - 14:36 (00:36)
0830	14:36 - 15:18 (00:42)
0648	15:00 - 15:36 (00:36)
0834	15:36 - 16:18 (00:42)

No.	ETD → ETA
0654	16:00 - 16:36 (00:36)
0658	16:32 - 17:09 (00:37)
0838	16:36 - 17:18 (00:42)
0660	17:00 - 17:36 (00:36)
0664	17:32 - 18:09 (00:37)
0842	17:36 - 18:18 (00:42)
0666	18:00 - 18:36 (00:36)
0670	18:32 - 19:09 (00:37)
0846	18:36 - 19:18 (00:42)
0672	19:00 - 19:36 (00:36)
0676	19:32 - 20:09 (00:37)
0850	19:36 - 20:18 (00:42)
0678	20:00 - 20:36 (00:36)
0854	20:36 - 21:18 (00:42)
0684	21:00 - 21:36 (00:36)
0858	21:36 - 22:18 (00:42)
0690	22:05 - 22:41 (00:36)
0862	22:40 - 23:23 (00:43)
0696	22:59 - 23:38 (00:39)

Appendix C1. Sun Moon Lake Route

Taichung → Sun Moon Lake

Departure：Taichung → Sun Moon Lake

高鐵台中站 HSR Taichung Station	埔里遊客中心 Puli Vistor Center	愛蘭橋頭（牛耳石雕公園） Puli, Ailan Bridge	埔里轉運站 Puli Station	暨南大學 NCNU	桃米坑（紙教堂） Taomikeng (Paper Dome)	大雁（澀水社區） Dayan	九族文化村 Formosan Aboriginal Culture Village	魚池 Yuchi	日月老茶廠 Antique Assam Tea Farm	日月潭 Sun Moon Lake
08:10	08:47	08:50	09:00	–	09:10	09:15	09:25	09:30	09:33	09:40
08:25	09:02	09:05	–	09:10	09:16	09:25	–	09:35	09:38	09:55
08:20	09:10(中台禪寺) - 09:11(中台世界博物館) - 09:30(埔里轉運站)									10:10
08:45	09:22	09:25	–	09:30	09:36	09:45	–	09:55	09:58	10:05
09:10	09:47	09:50	10:00	–	10:10	10:15	10:25	10:30	10:33	10:40
09:25	10:02	10:05	–	10:10	10:16	10:25	–	10:35	10:38	10:55
09:45	10:22	10:25	–	10:30	10:36	10:45	–	10:55	10:58	11:05
10:10	10:47	10:50	11:00	–	11:10	11:15	11:25	11:30	11:33	11:40
10:45	11:22	11:25	–	11:30	11:36	11:45	–	11:55	11:58	12:05
11:10	11:47	11:50	12:00	–	12:10	12:15	–	12:20	12:23	12:30
11:45	12:22	12:25	–	12:30	12:36	12:45	–	12:55	12:58	13:05
12:10	12:47	12:50	13:00	–	13:10	13:15	–	13:20	13:23	13:30
12:45	13:22	13:25	–	13:30	13:36	13:45	–	13:55	13:58	14:05
13:10	13:47	13:50	14:00	–	14:10	14:15	–	14:20	14:23	14:30
13:45	14:22	14:25	–	14:30	14:36	14:45	–	14:55	14:58	15:05
13:50	14:40(中台禪寺) - 14:41(中台世界博物館) - 15:00(埔里轉運站)									15:40
14:10	14:47	14:50	15:00	–	15:10	15:15	–	15:20	15:23	15:30
14:45	15:22	15:25	–	15:30	15:36	15:45	–	15:55	15:58	16:05
15:10	15:47	15:50	16:00	–	16:10	16:15	–	16:20	16:23	16:30
15:45	16:22	16:25	–	16:30	16:36	16:45	–	16:55	16:58	17:05
16:10	16:47	16:50	17:00	–	17:10	17:15	17:25	17:30	17:33	17:40
16:45	17:22	17:25	–	17:30	17:36	17:45	–	17:55	17:58	18:05
17:10	17:47	17:50	18:00	–	18:10	18:15	–	18:20	18:23	18:30
18:10	18:47	18:50	19:00	–	19:10	19:15	–	19:20	19:23	19:30
19:10	19:47	19:50	20:00	–	20:10	20:15	–	20:20	20:23	20:30
20:10	20:47	20:50	21:00	–	21:10	21:15	–	21:20	21:23	21:30

Weekend & Holiday only

Appendix C2. Sun Moon Lake Route

Sun Moon Lake → Taichung

Return：Sun Moon Lake → Taichung

日月潭 Sun Moon Lake	日月老茶廠 Antique Assam Tea farm	魚池 Yuchi	九族文化村 Formosan Aboriginal Culture Village	大雁（澀水社區） Dayan	桃米坑（紙教堂） Taomikeng (Paper Dome)	暨南大學 NCNU	埔里轉運站 Puli Station	愛蘭橋頭（牛耳石雕公園） Puli, Ailan Bridge	高鐵台中站 HSR Taichung Station
07:25	07:31	07:35	–	07:40	07:43	–	08:00	08:05	08:50
08:25	08:31	08:35	–	08:40	08:43	–	09:00	09:05	09:50
08:40	08:46	08:50	–	08:55	08:58	09:00	–	09:05	10:00
09:10	09:16	09:20	09:25	09:35	09:38	–	09:55	10:00	10:45
09:40	09:46	09:50	–	09:55	09:58	10:00	–	10:05	11:00
10:25	10:31	10:35	–	10:40	10:43	–	11:00	11:05	11:50
10:30	11:00(埔里轉運站) – 11:19(中台世界博物館) – 11:20(中台禪寺)								12:20
10:40	10:46	10:50	–	10:55	10:58	11:00	–	11:05	12:00
11:25	11:31	11:35	–	11:40	11:43	–	12:00	12:05	12:50
11:40	11:46	11:50	–	11:55	11:58	12:00	–	12:05	13:00
12:25	12:31	12:35	–	12:40	12:43	–	13:00	13:05	13:50
12:40	12:46	12:50	–	12:55	12:58	13:00	–	13:05	14:00
13:25	13:31	13:35	–	13:40	13:43	–	14:00	14:05	14:50
13:40	13:46	13:50	–	13:55	13:58	14:00	–	14:05	15:00
14:25	14:31	14:35	–	14:40	14:43	–	15:00	15:05	15:50
14:40	14:46	14:50	–	14:55	14:58	15:00	–	15:05	16:00
15:10	15:16	15:20	15:25	15:35	15:38	–	16:00	16:05	16:50
15:40	15:46	15:50	–	15:55	15:58	16:00	–	16:05	17:00
16:10	16:16	16:20	16:25	16:35	16:38	–	17:00	17:05	17:50
16:30	17:00(埔里轉運站) – 17:19(中台世界博物館) – 17:20(中台禪寺)								18:20
16:40	16:46	16:50	–	16:55	16:58	17:00	–	17:05	18:00
17:10	17:16	17:20	17:25	17:35	17:38	–	18:00	18:05	18:50
17:40	17:46	17:50	–	17:55	17:58	18:00	–	18:05	19:00
18:25	18:31	18:35	–	18:40	18:43	–	19:00	19:05	19:50
18:40	18:46	18:50	–	18:55	18:58	19:00	–	19:05	20:00
19:25	19:31	19:35	–	19:40	19:43	–	20:00	20:05	20:50

Weekend & Holiday only

Note

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