

ISPMM' 2006

FINAL PROGRAMME

THE 3RD INTERNATIONAL SYMPOSIUM ON PRECISION MECHANICAL MEASUREMENTS



Sponsored by

International Committee on Measurements and Instrumentation
National Natural Science Foundation of China
Chinese Society for Measurement

Organized by

Hefei University of Technology

Co-organized by

Dept. of Mechanical Eng. National Taiwan University
Center for Precision Nanosystems, Tohoku University



Conference Schedule in Summary

August 2: Registration at the Lobby of Xinjiang Hotel World Plaza
Reception dinner from 19:00

August 3

8:00 ~ 9:30	Breakfast
9:30 ~ 10:00	Opening Ceremony (Multi-function Room)
10:00 ~ 10:40	Group Photo & Coffee Break
10:40 ~ 11:30	Keynote Speech 1
11:30 ~ 12:20	Keynote Speech 2
12:20 ~ 14:00	Lunch
14:00 ~ 15:00	Poster Paper Presentation & Industry Exhibition
15:00 ~ 15:50	Keynote Speech 3
15:50 ~ 16:40	Keynote Speech 4
16:40 ~ 17:10	Coffee Break
17:10 ~ 17:40	Invited Speech 1
17:40 ~ 18:10	Invited Speech 2
20:00 ~ 22:00	Banquet (The Pearl Palace)

August 4

8:00 ~ 9:30	Breakfast
9:30 ~ 11:10	Oral Session A1, B1, C1
11:10 ~ 11:30	Coffee Break
11:30 ~ 13:10	Oral Session A2, B2, C2
13:10 ~ 15:00	Lunch (The Pearl Palace)
15:00 ~ 16:40	Oral Session A3, B3, C3
16:40 ~ 17:00	Coffee Break
17:00 ~ 18:40	Oral Session A4, B4, C4
19:00 ~	Dinner (The Pearl Palace)

August 5 ~ 6: Post Tour

Keynote Speakers

Professor Gerd Jäger

Prof. Jäger is University-Professor at the Technische Universität Ilmenau and head of the Institute of Process Measurement and Sensor Technology at the Technische Universität Ilmenau. He is also guest professor of Tianjin University of China and member of the Academy Erfurt. He set up the SIOS Meßtechnik GmbH company in 1991. He was awarded of an honorary doctorate (h.c.) from the National Technical University of the Ukraine, Kiev in 1998 and another honorary doctorate by the National University “Lvivska Politechnika”, Lviv in 2002. Prof. Jäger’s research fields and lectures lie in process measurement and sensor technology, laser-based nonmeasuring and positioning technology, force measurement and weighing technique and temperature measurement. He has obtained about 40 patents and published scientific papers in four textbooks and specialist books and about 60 publications in specialist journals. He has given about 160 lectures at national and international scientific conferences and also given many guest lectures in Germany, China, Ukraine and USA.



Professor Guofan Jin

Professor Guofan Jin was born in 1929. He graduated from Beijing University in 1950. Since 1952 he has been working in the Department of Precision Instruments and Mechanology in Tsinghua University, China. He was the Head of Department from 1985 to 1990, and Dean of School of Mechanical Engineering from 1995 to 1999. He is a worldwide famous scholar in Optical Engineering with a broaden research interests, such as Optical Storage, Optical Computation, Holographic Gratings, Binary Optics, etc. He was elected as the Fellow of Optical Society of America in 1990, Fellow of SPIE in 1991, Academician of Chinese Academy of Engineering in 1994 and the Vice President of ICO (International Committee of Optics) since 2002. He has published 7 textbooks and more than 300 technical papers.



Professor Steven Y. Liang:

Dr. Steven Y. Liang is Morris M. Bryan, Jr. Professor in Mechanical Engineering for Advanced Manufacturing Systems at Georgia Institute of Technology, USA. He holds a 1987 Ph.D. in Mechanical Engineering from the University of California at Berkeley. He was founding Director of Georgia Tech's Precision Machining Research Consortium and currently Director of the Manufacturing Education Program at Georgia Tech. Dr. Liang also serves as the Chief Technical Officer of EcoTech Machinery, a publicly-traded machine tool manufacturing company of over 8,000 employees. Dr. Liang's research leadership lies in the areas of micro/nano scale manufacturing, ultra-precision machining, and diagnostics/prognostics of machinery. He has supervised over 50 Post-Doctoral studies, Ph.D. dissertations, and M.S. theses and has authored in excess of 200 book chapters, archival journal papers, and professional conference articles in these areas. Dr. Liang is President-Elect of the North American Manufacturing Research Institution, Society of Manufacturing Engineers (NAMRI/SME). He is also appointed Chair of the Manufacturing Engineering Division of The American Society of Mechanical Engineers (MED/ASME). Dr. Liang is the recipient of many prestigious awards including the Robert B. Douglas Outstanding Young Manufacturing Engineer Award of SME, the Ralph R. Teetor Education Award of the Society of Automotive Engineers, and Blackall Machine Tool and Gage Award from ASME. Dr. Liang is a Fellow of ASME.



Professor Wei Gao:

Wei Gao received his PhD degree in Precision Engineering from Tohoku University, Japan in 1994. He is currently the director of the Center for Precision Nanosystems, Department of Nanomechanics. His research interests include optical sensors, precision nanometrology and precision nanosystems. He acted as a visiting professor of the Center for Precision Metrology, University of North Carolina, Charlotte in 1998. He is a member of the SPIE, ASPE, JSPE, and JSME. He is also a Corresponding Member of CIRP. He serves as an Associate Editor for Precision Engineering, Journal of International Society for Precision Engineering and Nanotechnology and an Editorial Board member for International Journal of Surface Science and Engineering.



August 3, 2006 (Multi-function Room)

Opening Ceremony (9:30 ~ 10:00)	
Chairman: Prof. Kuang-Chao Fan	
National Taiwan University, Changjiang Scholar of Hefei University of Technology, China	
Prof. Congwei Xu (President of Hefei University of Technology, China) Prof. Zhu Li (Founding Chair, ICMI) Prof. Guofan Jin (Academician, Chinese Academy of Engineering, Tsinghua University, China) Prof. Yuanzhong Lei (National Natural Science Foundation of China) Prof. Yuri Chugui (Academician, Russian Academy of Engineering, Russia)	
10:00 ~ 10:40	Group Photo & Coffee Break
Keynote Session 1, Chairman: Prof. Wei Gao	
10:40 ~ 11:30	“Nanomeasuring and Nanopositioning Engineering” <i>Prof. G. Jager, Technische Universität Ilmenau, Germany</i>
11:30 ~ 12:20	“Nanotechnology in China” <i>Prof. Guofan Jin, Academician, Chinese Academy of Engineering, Tsinghua University, China</i>
12:20 ~ 14:00	Lunch (The Pearl Palace)
14:00 ~ 15:00	Poster Session and Industrial Exhibition
Keynote Session 2, Chairman: Prof. Yuri Chugui	
15:00 ~ 15:50	“Mechanical Machining and Metrology at Micro/Nano Scales” <i>Prof. Steven Y. Liang, Georgia Institute of Technology, USA</i>
15:50 ~ 16:40	“State-of-the-art laser-based systems for precision mechanical measurements” <i>Prof. Wei Gao, Center for Precision Nanosystems, Tohoku University, Japan</i>
16:40 ~ 17:10	Coffee Break
Invited Session, Chairman: Prof. Grier C. I. Lin	
17:10 ~ 17:40	“Novel optical measuring systems and laser technologies for industry and science” <i>Prof. Yuri V. Chugui, Siberian Branch of the Russian Academy of Eng., Russia</i>
17:40 ~ 18:10	“New developments of coordinate measuring techniques” <i>Prof. Guoxiong Zhang, Tianjin University, China</i>
20:00 ~	Banquet (The Pearl Palace)

Oral Session 1

(August 4, 9:30 ~ 11:10)

A1 (Room: 1621)	Displacement by Grating Technology
<p>Chairman: Prof. Wei GAO (Tohoku Univ)</p> <p>Feature speech: (25 minutes for each paper)</p> <p>A1-1 “Effects of angle misalignments on pitch measurements of two-dimensional gratings using an AFM” <i>Kentaro Sugawara, National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ/AIST), Japan</i></p> <p>Paper presentation: (15 minutes each, including 3 min. Q & A)</p> <p>A1-2 “Low Power Grating Detection System Chip For High speed Low Cost Length And Angle Precision Measurement” <i>Ligang Hou, Beijing Univ. of Tech, China</i></p> <p>A1-3 “Development of a new angular displacement based on principle of vernier caliper” <i>Xinghong Zhang, Chongqing Institute of Technology, China</i></p> <p>A1-4 “Non-linearity Error Separation and Self-correction Method for Time Grating Displacement Sensor” <i>Xiaokang Liu, Hefei University of Technology, China</i></p> <p>A1-5 “Research on pitch analysis methods for calibration of one-dimensional grating standard based on nanometrological AFM” <i>Huang Q X, Hefei University of Technology, China</i></p> <p>A1-6 “A linear diffraction grating interferometer with high accuracy” <i>Yejin Chen, Kuang-Chao Fan, Hefei University of Technology & National Taiwan University, China</i></p>	
B1 (Room: 1521)	Displacement by Laser Technology
<p>Chairman: Dr. Charles Wang (Optodyne Co.)</p> <p>Feature speech: (25 minutes for each paper)</p> <p>B1-1 “A high-resolution displacement sensor based on multiple feedback effect of birefringence dual frequency lasers” <i>Shulian Zhang, Tsinghua University, China</i></p> <p>Paper presentation: (15 minutes each, including 3 min. Q & A)</p> <p>B1-2 “Heterodyne interferometer for measurement of in-plane displacement with sub-nanometer resolution” <i>Ju-Yi Lee, National Central University, Taiwan, China</i></p> <p>B1-3 “A laser structured light system for inspection of wear and defects of contact wire in train’s electro-supply network” <i>Yuri V. Chugui, Siberian Branch of the Russian Academy of Sciences (TDI SIE SB RAS), Russia</i></p> <p>B1-4 “High precision large scale metrology using chirped laser pulse” <i>Wang Zhongyu, Beihang University, China</i></p> <p>B1-5 “Laser range finding using DSSS and PSK modulation” <i>Jia Xuedong, Institute of Surveying and Mapping of the Information University, China</i></p>	

C1 (Room: 1421)	Coordinate Measuring Machines
<p>Chairman: Prof. Guoxiong Zhang (Tianjin Univ.)</p> <p>Feature speech: (25 minutes for each paper)</p> <p>C1-1 “Topography measurement of gear tooth flanks with CMM and evaluation of pitch deviations with the new definition” <i>Syuhei Kurokawa, Kyushu University, Japan</i></p> <p>Paper presentation: (15 minutes each, including 3 min. Q & A)</p> <p>C1-2 “Study of CMMs synthetic dynamic error under different position and velocity based dual linear returns” <i>Ma Xiushui, Zhejiang University, China</i></p> <p>C1-3 “Research on Dynamic Accuracy of Coordinate Measuring Machines” <i>Baogang Chen, Hefei University of Technology, China</i></p> <p>C1-4 “A high sensitivity optical touch trigger probing system for down scaled 3D CMMs” <i>G.C.I Lin, University of South Australia, SA</i></p> <p>C1-5 “Development of a precision inspection machine for assuring the dynamic quality of the pick-ups used in optical disc drives” <i>Paul C.-P. Chao, National Chiao-Tung University, Taiwan, China</i></p>	

Coffee Break 11:10 ~11:30

Oral Session 2

(August 4, 11:30 ~ 13:10)

A2 (Room: 1621)	Profile Measurement by Interferometry
<p>Chairman: Prof. Gerd Jäger (TU Ilmenau)</p> <p>Feature speech: (25 minutes for each paper)</p> <p>A2-1 “Surface roughness parameters measurements by Digital Holographic Microscopy (DHM)” <i>Frédéric Montfort, Lyncée Tec SA, PSE-A, Switzerland</i></p> <p>Paper presentation: (15 minutes each, including 3 min. Q & A)</p> <p>A2-2 “White-light interferometric measurement of spherical and aspheric surfaces” <i>Chang Suping, Huazhong University of Science and Technology, China</i></p> <p>A2-3 “White Light Interferometric Techniques in Micro-Structure Measurement” <i>Ya-Hui Hu, Nanya Institute of Technology, Taiwan, China</i></p> <p>A2-4 “Determination of vertical-scan range for a white-light interferometer” <i>Jin-Liang Chen, Center for Measurement Standards/ITRI, Taiwan, China</i></p> <p>A2-5 “Characteristics of Capacitance-Micro-Displacement for Model of Complex Interior Surface 3D-Taiji Ball and Its Applications” <i>Zhu Ruo-Gu, China Institute of Metrology, China</i></p>	
B2 (Room: 1521)	Profile Measurement by Triangulation and Focusing
<p>Chairman: A. K. Forrest (Imperial College)</p> <p>Feature speech: (25 minutes for each paper)</p> <p>B2-1 “3D Surface Profilometry Using Digital Color Fringes for Measurement Accuracy Enhancement” <i>Liang-Chia Chen, National Taipei University of Technology, Taiwan, China</i></p> <p>Paper presentation: (15 minutes each, including 3 min. Q & A)</p> <p>B2-2 “Automatic optical-electronic system for measurements of elements shifts and deformations in huge mechanical and engineering constructions” <i>Yuri V. Chugui, Siberian Branch of the Russian Academy of Sciences (TDI SIE SB RAS), Russia</i></p> <p>B2-3 “Development of Automatic 3D Profile Measuring System” <i>Lin Weiyuan, National Taiwan University, Taiwan, China</i></p> <p>B2-4 “Online Multi-Dimensional Measurement of Complex Workpieces Based on Stereo Computer Vision” <i>Xu Zhenying, Jiangsu University, China</i></p> <p>B2-5 “3D measurement using shape-from-focus approach” <i>Shih-Chieh Lin National Tsing-Hua University, Taiwan, China</i></p>	
C2 (Room: 1421)	Sensors and motion control

Chairman: Prof. Tien-I Liu (California State University)

Paper Presentation: (15 minutes each, including 3 min. Q & A)

C2-1 “A Novel CMOS Sensor for Measuring Thermal Diffusivity of Liquid”

Ping-Hei Chen, National Taiwan University, Taiwan, China

C2-2 “Design Analysis of Voice Coil Motor for Active Vibration Isolation”

Yi-Cheng Liu, National Taiwan University, Taiwan, China

C2-3 “Precision measurement and decoupled control of a planar motion stage”

Song Yi Dian, Tohoku University, Japan

C2-4 “Study of the Development Platform of Smart Piezoelectricity Sensors”

Zheng Longjiang, Yanshan University, China

C2-5 “The no-rest switching iterative learning control for a novel optical scanning system”

Jia-Yush Yen, National Taiwan Univ., Taiwan, China

C2-6 “Measurement of a silicon-based non-silicon MEMS micromirror”

Luo Yuan, Chongqing University of Posts & Telecommunications, China

Lunch 13:10 ~ 15:00

Oral Session 3

(August 4, 15:00 ~ 16:40)

A3 (Room: 1621)	Machine Tool Measurements
Chairman: Prof. Hong Young (National Taiwan University)	
Feature speech: (25 minutes for each paper)	
A3-1 “Machine Tool 3D Volumetric Positioning Error Measurement Under Various Thermal Conditions”	
<i>C. Wang, Optodyne, Inc., USA</i>	
Paper Presentation: (15 minutes each, including 3 min. Q & A)	
A3-2 “H_∞-based active microvibration control of an ultra-precision machine tool”	
<i>Zhang Chunliang, Nanhua University, China</i>	
A3-3 “Development of an On-Machine Micro Measuring Technique”	
<i>Y. S. Liao, National Taiwan University, Taiwan, China</i>	
A3-4 “Intermittent process measurement and process capability analysis using MP700 touch trigger probe on a CNC machining center”	
<i>Fang-Jung Shiou, National Taiwan University of Science and Technology, Taiwan, China</i>	
A3-5 “Hybrid HMM/SVM method for predicting of cutting chatter”	
<i>Zhang Chunliang, Nanhua University, China</i>	
A3-6 “Ultra-precision on-machine measurement system for aspheric optical elements”	
<i>Y. Nagaike, Tohoku University, Japan</i>	
B3 (Room: 1521)	Surface Topography

Chairman: Prof. Yongsheng Gao (HKUST)

Feature speech: (25 minutes for each paper)

B3-1 “Topology measurements and applications”

Junfeng Song, National Institute of Standards and Technology (NIST), USA

B3-2 “Surface topology from multi-angular reflectivity”

A.K.Forrest, Imperial College Mechanical Engineering Dept., UK

Paper Presentation: (15 minutes each, including 3 min. Q & A)

B3-3 “A compact AFM system for rapid and large area surface topography measurement”

Bing-Feng Ju, Tohoku University, Japan

B3-4 “Geometrical information extraction from laser speckle pattern images using texture analysis”

Rong-Sheng Lu, Hefei Univ. of Technology, China.

B3-5 “The comparison between ASME and ISO standards on surface texture”

Hu Kai, Huazhong Univ. of Sci. & Tech, China

**C3
(Room: 1421)**

Form and Defect Measurement and Analysis

Chairman: Prof. Shulian Zhang (Tsinghua University)

Paper Presentation: (15 minutes each, including 3 min. Q & A)

C3-1 “Technology of freeform surface reconstruction of point cloud from laser scanning system based on non-uniform B-spline”

Guo Yingfu, Xi’an Jiaotong Univ., China

C3-2 “Data processing for measuring tread contour of a train wheel based on computer vision”

Zhao Qiancheng, Hunan University of Science and Technology, China

C3-3 “Surface faults evaluation by optical imaging method for electropolishing process”

Shuo-Jen Lee, Yuan Ze University, Taiwan, China

C3-4 “Research on Anisotropy of Measurement for Complex Curved Surfaces”

Shi Zhaoyao, Beijing University of Technology, China

C3-5 “Research about application of the data fusion to environmental measuring in coal mines”

Fu Hua, Liaoning Technical University, China

Coffee Break: 16:40 ~ 17:00

Oral Session 4

(August 4, 17:00 ~ 18:40)

A4 (Room: 1621)	Measurement Science and Technology
<p>Chairman: Prof. Rong-Sheng Lu (Hefei Univ. of Technology)</p> <p>Paper Presentation: (15 minutes each, including 3 min. Q & A)</p> <p>A4-1 “Research on the key techniques of form and position evaluation based on the Genetic Algorithm” <i>Cui Changcai, Huaqiao University, China</i></p> <p>A4-2 “Research on new method in separation of errors” <i>Zhu Ge, chongqing institute of technology, China</i></p> <p>A4-3 “Analysis of a Precise Instrument for Measuring Reference Level Involute” <i>Wang Xiaodong, DaLian University of Technology, China</i></p> <p>A4-4 “The optimizing demodulation new method of energy operator arithmetic and the research of comparison with Hilbert transformation” <i>Zhu Ge, chongqing institute of technology, China</i></p> <p>A4-5 “A Study of Mixing Characteristics for a Micromixer with Helical Channel and Grooved Surfaces” <i>Ming Chang, Chang Yung Christian University, Taiwan, China</i></p> <p>A4-6 “Propagation Characteristics of Ultrasonic Guided Waves in Bolt Embedded in Soil” <i>He Cunfu, Beijing University of Technology, China</i></p>	
B4 (Room: 1521)	GPS and measurement systems
<p>Chairman: Prof. Wang Zhongyu (Beihang University)</p> <p>Paper Presentation: (15 minutes each, including 3 min. Q & A)</p> <p>B4-1 “Data modeling of the Next Generation GPS information system” <i>Lu Wenlong, Huazhong University of Science and Technology, China</i></p> <p>B4-2 “A New Method Based on WMRA and ANN for GPS/SINS Integration for aircraft Navigation” <i>ZHU Xuefen, Southeast University, China</i></p> <p>B4-3 “Evaluation & management of measurement uncertainty in the new generation Geometrical Product Specification (GPS)” <i>PENG Heping, Huazhong University of Science and Technology, China</i></p> <p>B4-4 “Research and development of network virtual instrument laboratory” <i>Cui Hongmei, Inner Mongolia Agricultural University, China</i></p> <p>B4-5 “A new precise cubage measurement system for columned oilcan” <i>Jiang Lixing, The Institute of Surveying and Mapping of the Information University, China</i></p>	
C4 (Room: 1421)	Mechanical Measurements
<p>Chairman: Prof. Y.S. Liao (National Taiwan Univ.)</p> <p>Feature speech: (25 minutes for each paper)</p>	

C4-1 “On-line measurements for monitoring and diagnosis of glass production furnaces”

Tien-I Liu, California State University, USA

Paper Presentation: (15 minutes each, including 3 min. Q & A)

C4-2 “Dynamic Characteristics and Testing Techniques of Microstructures under High Load”

Wang Xiaodong, Dalian University of Technology, China

C4-3 “Volumetric effects on the dynamic pressure wave in hydraulic system”

Tsing-Tshih TSUNG, National Taipei University of Technology, China

C4-4 “Bonding strength measurement of electroforming porous copper for heat sinks”

Hsiharng Yang, National Chung Hsing University, Taiwan, China

C4-5 “Possible Applications of the Levitation Mass Method to Precision Mechanical Measurements”

Yusaku Fujii, Gunma Univ., Japan

Programme of Tours

(A bus with English tour guide is provided)

August 5:

7:00	Breakfast
8:00	Departure from hotel lobby
11:00	Arrive at Turpan (吐鲁番)
11:00~12:00	Visit the Karez Well (坎儿井), the Dessert Botanic Garden (沙漠植物园), and the zero attitude above sea level (海拔零点)
12:00~12:30	Short stop at a jade shop
12:40~1:10	Lunch
1:10~1:50	To the Ancient City of Gaochang (高昌古城)
1:50~3:00	Visit the Ancient City of Gaochang
3:20~4:00	Visit Bezeklik Thousand Buddha Caves (万佛宫)
4:30~5:30	Visit the Grape Valley (葡萄沟)
5:30~6:00	Visit the family of the local people (民族家访)
6:00~9:00	Return to Urumqi
9:00	Dinner

August 6:

7:30	Breakfast
8:30	Departure from hotel lobby
10:30~12:50	Visit the Tianchi Lake (天池)
1:00~1:30	Lunch
1:30~3:00	Return to Urumqi
3:00~3:40	Bai Shi City Jade shop

4:00~5:00	Visit the specimen display of Xinjiang Ecology and Geological Institute of Chinese Science Academy (中科院新疆生态与地理研究所标本馆)
5:30~7:30	Visit the Xinjiang Culture Street (新疆民族风情街)
8:00	Dinner

Tianchi (Heaven) Lake is an alpine drift lake shaped in the Quaternary Glacier period. Northern bank of the lake is a natural dike that is a moraine ridge. Tianchi Lake is a world famous alpine drift lake, which was listed by the State as one of the key scenic spots in 1982. The Tianchi Lake scenic area can be divided into four natural view belts: lower mountain belt, mountain coniferous forest belt, alpine and subalpine belt, and ice and snow belt. Another attractive scenic spot is Bogda Peak, which is covered by ice and snow all the year round and thus like wearing a body armor, so ancient Mongolians thought that this was “God” and named it “Bogda”. It attracted many climbers from all over the world.

The Ancient City of Gaochang lies at the foot of the Flaming Mountain 40 kilometers southeast of the Turpan County seat, which has been the only passageway for communication between the East and West since the Han Dynasty and Tang Dynasty, and an important section of the ancient Silk Road.

Flaming Mountain is situated in the north of Turpan Basin. Along the Turpan-Shanshan road there are red mountains about 100 km long. These mountains stretch in a east-west direction, and are about 10 km wide from south to north and 500 m above sea level. The highest peak is 850 m in height. It is famous for its high temperature in summer season. It was said that at the top of the mountain the air temperature is as high as 80°C. Under the strong sun, thermal air current rises, and the red sand rock gives out red light just like fire, so the mountains are named Flaming Mountains.

Grape Valley is situated in a canyon, west side of Flaming Mountain, 15 km northeast of the seat of Turpan County. It is 8 km long and 500 m wide. Grape trees are planted along both sides of the valley. A modern Winery has been established producing various kinds of grape wines and grape cans. White grape wine produced here boasts a nice taste and is popular with both Chinese and foreign guests. After experiencing the fierce heat of Flaming Mountains, taking a rest here and enjoying some grapes will give you a absolute relax.

Turpan is located in a depression with the area of more than 1000 square kilometers of the eastern part of Xinjiang and some 80 meters below the sea level, and the nearby the Moon Lake, the lowest water surface is 154 meters below the sea level, the second lowest continental point in the world after the dead sea. Turpan is called the land of fire, which was derived from the intense summer temperature, the highest ever recorded was 47.5°C and in summer the ground surface temperature is about 70°C. The depression is characterized by high temperature and rare perspiration, so it is hot but it is not wet during summer. Although it is extremely hot, the streets are full of people.

In history, Turpan was the capital of ancient Gaochang Kingdom (from the sixth century) and later the administration residence of Xizhou. It was a very important juncture on the Silk Road through which the western cultures and Chinese culture encountered and crashed and exchanged. A great many historical sites and cultural relics have remained. And the city is known as a “natural museum of man and culture”.