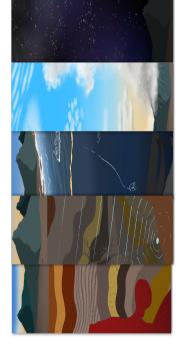


National Taiwan Normal University, Taiwan



Dept. Introduction https://shorturl.at/fxLPT

# **Dept. of Earth Sciences in NTNU** Research Programmes Admission Guide

Studying in NTNU

**Research Topics** 

How to apply

International graduate students recruiting! Deadline: July 31, 2023



# **Research Topics**

- This is one of the rare department around the world allowing the students to learn:
  - (1) multiscale astrophysical phenomena
  - (2) multiscale weather phenomena
  - (3) multiscale physical oceanography
  - (4) multiscale geological phenomena phenomena
  - (5) multiscale geophysical phenomena
- The interdisciplinary studies are highly recommended!
- Hot topics related to global change, SDGs, and others. Kuroshio energy harvesting | Geothermal energy Prediction of multi-hazards chain Characteristics and environmental impact of extreme weather events
   Volcanic eruptions on Io | Mars quakes Geochemistry analysis using Mass spectrometry ...

For more topics please see the following two slides!







Cheng-Ta Chen

Li-Shan Tseng

Yacupira Hach

## Atmospheric Science



Wan-Ru Huan

1==

Fang-Ching Chies

### multiscale weather phenomena

Climate modeling, Mesoscale, mountain, synopticm, monsoon meteorology, Severe weather system Cloud-radiation interaction, Air-sea interaction



## Oceanography

### multiscale physical oceanography

Physical oceanography, Numerical modeling, Semote sensing, Typhoon-ocean Interaction, Regional geology, Science education

BH BH : NASARE

# 師大地球科學系 Dep. of Earth Sciences, NTNU

## Geology

### multiscale geological phenomena

Geodynamics plate reconstruction Sequence seismic stratigraphy, Regional tectonics of southeast As Stable isotope geology. Paleoenvironmental change Geochemistry, Core analysis, Igneous Petrologys Petrology







## Geophysics

### mult cale geophysical phenomena

Observationa ismloay Environmental seismology

圖片出自:NASA/JPL-Caltech





atty Pei-Ying Lin



ing-Kumm Yek



Meng-Wan Yeh

Yuch-Nina Les



Astronomy

multiscale astrophysical phenomena

Star formation, Planetary Science, Radio astronomy, Astrochemistry,

X-ray and extragalactic astronomy,

圖片出自:星天日和工作室

ciences

arth<sub>2</sub>

Formation and evolution of galaxies

### Department of Earth Sciences

My main research focus has been on the stable carbon and oxygen isoteo compositions and elemental contents of Palaeozoic and Cenozoic fossil shells (mainly brachiopods molluscs and foraminifers) and carbonate rocks as a geochemical tool to reconstruct global palaegenvironments, as well as to tool to achieve/constrain stratigraphical correlations

Techniques used in study Sample collection, petrographic thin sections preparation, observation of diagenesis using cathodoluminescence microscope, Isotope Ratio Mass Spectrometer, and Inductively Coupled Plasma Optical Emission Spectrometer (ICP-DES).

Horng-sheng Mil, Professor Department of Earth Sciences, t44006@ntnu.edu.tw

Background: PhD in Geology,



Texas A&M University College Station, TX, USA

#### **Department of Earth Sciences**

#### Study typhoon and Mei-yu rainfall

Strong southwesterly flows

transport moisture-laden air to Taiwan, resulting in heavy rainfall.

Study of Paleoenvironment

ssman, E.L., 1994. Late Pennsylvanian seasonality O and elemental composition of a brachioport shell

Relocum in: Association Sectory 22, 661-664.
Mil, H.-S., Shi, G. R., and Wang, C.-A., 2013, Late Paleozoic middle-latitude

wana environment -stable isotope records from Western Australia: wana Research, v. 24, p. 125-138. H, Chen, Y.-C., Wang, X. T., Wong, G. T. F., Cohen, A. L., DaCarlo, T. M. and, M. A., Mil, H.-S., and Sigman, D. M., 2017, 21st-century rise in anotexic information description on a transfer compliand Eclipson. V 355.

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The first to publish critical Late Paleozoic middle-latitude data on Late Carboniferous Gondwana environment

seasonality

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In winter high marine

the paths of the North

Kuroshio Current.

houndary layer heights are

annrovimately located within

Equatorial Current and the

to los

My researches mainly focus on the studies of southwesterly nos Meixu rainfall and marine ho flows, typhoons, Mei-yu rainfail, and marine boundary layer. Using 40-yo di tranological data, we have identified formation stages of southwesterly flows in Mei-yu seasons. In a study of Typhoon Marakou, we have found the roles of typhoon interaction with southwesterly flows in heavy rainfail. We have also documented the marine boundary layer height in westen also documented the marine boundary layer height in westen torth Pacific using the COSM/CPMOSSI3 3 GPS radio occultation data.

Techniques used in study Weather Research and Forecast model simulation Data assimilation, Ensemble forecast, Ferrain effect

Fang-Ching Chien, Professor rtment of Earth Sciences ifi@ntnu.edu.tw

**Department of Earth Sciences** 

Background: Ph.D. in Atmospheric Sciences, Department of Atmospheric Sciences, University of Washington, USA

Chien, F.-C.\*, J.-S. Hong, and Y.-H. Kuo, 2019: The marine boundar ayer height over the western North Pacific based on GPS radio ccultation, island soundings, and numerical models. Sensors, 19, https://doi.org/10.3390/s19010155.
 Chien, F.-C.\*, and Y.-C. Chiu, 2019: A composite study of southwesterly flows and rainfall in Taiwan. J. Meteor. Soc. Japan, 97,

SouthWesterry INDVo and Learner at starting to the source of the source

**Exploring the Solar System** 

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O.\* (Tseng et al., 2010)

Research Interest My work is focused on the simulations of the structure and compositions of the neutral clouds of different origins with a plasma chemistry model based on the latest space mission data such as Cassini and Rosetta. In addition. Lam particularly interested using the ground-based radio telescopes to study the small bodies in the solar system (i.e. Europa, Enceladus, Titan and comets), which can improve understanding of the sources, dynamics and evolution of their neutral exospheres and interactions with the ambient plasma environments.

#### Wei-Ling, Wendy, Tseng, Assistant Profe Department of Earth Sciences witseng@ntnu.edu.tw

Background: Sha. 2009 Ph.D., Astronomy, National Central University, Taiwan Post-Degree Appointments

Jan. 2012 – July 2014 Research Scientist Division of Space Science and Engineering, Southwest Research Institute, San Antonio, TX, USA Dec. 2009 – Nov. 2011 Research Associate (Postdor oriste (Postdor) Department of Materials Science and Engineering, University of Virginia, Charlottesville, VA, USA



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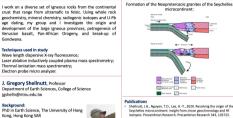
eractions between Saturn's atmosphere and its rings", Science, 362,

2382 Johnson, R. E., **Tseng, W.-L.**, Elrod, M. K., Persoon, A. M., 2017, "Nanograin Density Outside Saturn's A ring", Astrophysical Journal Letters, Vol. 334, No. 4 Gu, H., Cul, J., Liu, D. -D., Welbrock, A., **Tseng, W.-L.** & Xu, X. -J., 2019, Ar-Ar Geochronology Lab/ Earth Sciences Email: marywyeh@gmail.com You, H., Cui, J., Lu, D. -D., Webrock, A., Iseng, W. -L. & Xu, A. -J. 20. "Monte Carlo calculations of the atmospheric sputtering yields on Titan", *Astronomy & Astrophysics*, 263, A18 Coulson, I. M., Cordiner, M. A., Kuan, Y-J., Tseng, W.-L. et al., 2017.

MI - MIC

Background: PhD. In Structural Geology School of Earth Sciences, James Cook University, Townsville, Australia spectral and Continuum Imaging of Comet 252P/LINEAR", The omical Journal, Vol 153, No. 4





The Instance I have been Shellnutt, J.G., Nguven, T.D., Lee, H.-Y., 2020. Resolving the origin of the ibelinutt, J.G., Pham. T.T., Denvszyn, S.W., Yeh, M.-W., Tran, T.A., 2020 Magmatic duration of the Emeishan large igneous province: Insight from northern Vietnam. Geology 48, 457-461. Shelluutt, J.G., 2019. The curious case of the rock at Venera 8. Icarus 321, rock.

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### Department of Earth Sciences

TB

My research interests are mainly in mesoscale and synoptic meteorology and focus on hazardous precipitation systems and severe weathers, such as: typhoons (tropical cyclones), various mesoscale convective systems (MCSs) in the Mei-yu season, and severe local storms. I am also interested in issues related to numerical weather prediction (NWP) and the application of artificial intelligence (AI) in its decision-making process.

Gondwana.

Kong, Hong Kong SAF

Techniques used in study Cloud-resolving model (CRM): mesoscale model: large-scale parallel supercomputers (e.g., Taiwania 1, NTNU HPC): model imulations and sensitivity tests; gridded datasets for analysis potential vorticity (PV) inversion; diagnostic analysis

Chung-Chieh Wang, Professor and Chair Department of Earth Sciences and Institute of Marine Environmental Science and Technology Lab of Weather and Convection cwang@ntnu.edu.tw

Background: PhD in Atmospheric Sciences, Department of Geography, Ohio State University Columbus OH USA

Department of Earth Sciences.....

required. echniques used in study Structural & Microstructural geology Petrography Minorphysic

Mineralogy Radioactive Isotope Geochemistry

Meng Wan (Mary) Yeh, Professor

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Yeh & Shellnutt, 2018

blications (representative) TH Huang, MW Yeh\* (2020) Structural

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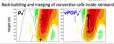


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**Geochronology Tectonic Structural Evolution** 

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Chiu et al., 2018

. ang-Henan Wu, Tang-Yi Lee, Ching-Hua Le, Sat

nat, MW Yeh, NHT Pham, TY Lee (2019) Cryptic regional magnatism in the Saharan Metacraton at 550 Ma. Procambrican Rosearch 332, 103398 Mai; Yu Lu Char; Meng Wan Yeh\*; Tung Yi Lee (2018, Apr). Tectoric

Individual research program can be found here https://shorturl.at/ceAN3

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Lab research mainly aims to analyze aspects of geological structures and to explore their construction relationship between stress and strain. Based on observations of geological structures from different structural levels on multiple scale ve examine and evaluate their characteristics of geometric features, kinematics and dynamics to understand the origin and the role in the context of orogenic evolution, and apply concepts and results to the stress assessment, strain analysis. fracture reactivation examination, and relevant technique development of underground resources and deep-seated warte diepocal

Techniques used in study Strain Evaluation, Microfabric Examination, In-Situ Stress Assessment, Fracture Characterization, Fault Reactivation Analysis,

En-Chao Yeb Associate Professor Department of Earth Sciences Structural Geomechanics Laboratory ecych@ntnu,edu.tw Background: vania State University 115 A



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Publications

#### Department of Farth Science Climate analysis and model simulation diagnosis Diumal rainfall frequency in Talwan

#### My research interests focus on the variations and related mechanisms of precipitation characteristics over the East Asian monsoon region I have conducted a series of studies examining the influence of long-term changes in large-scale Southern China. Recently, I'm also interested on validating the performance of satellite precipitation over Taiwan.

Techniques used in study Observational data; CMIP model simulation data; satellite precipitation data; reanalysis data; diagnostic analysis; monsoon climate; climate change; weather change; future

projection. Wan-Ru Huang, Professor



#### ORCID: https://orcid.org/0000-0002-2171-4075 COLLEGE OF SCIENCE, NATIONAL TAIWAN NORMAL UNIVERSITY

Department of Earth Sciences



also developed various tabletop games, digital media resources, and scaffolding materials to support students' learning of earth science. Ting-Kuang Yeh Atitudes Associate Professor, Department of Earth Sciences



Publications (updated) Ublications (updated) Hung, L. Y. Wang, S. M., & Yeh, T. K.\* (2023). Kolb's experiential learning theory and marine debris education: Effects of different stages on learning. Marine and marine debris education: Effects of different stages on learning. Marine Pollution Bulletin, 191, 114933. Hung, L. Y., Wang, S. M., & Yeh, T. K.\* (2022). Collaboration between the

Perceived behavioral control (PBC)

government and environmental non-governmental organisations for marine debris policy development: The Talwan experience. Marine Policy, 135, 104849. Chen, C. S., Chien, T. S., Lee, P. L., Jeng, Y., & Yeh, T. K.\* (2020). Prefrontal brain electrical activity and cognitive load analysis using a non-linear and non stationary approach. IEEE Access, 8, 211115-211124. COLLEGE OF SCIENCE, NATIONAL TAIWAN NORMAL UNIVERSITY

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Huang et al. (2015; IGR): Both the southwesterly flow over the South China Sea and the convergence at 11 IT over Taken have become weaker in the later previous these includion changes which could lead to a reduction in dynamical lifting over the past fixe decades, mu capital in the long-me dicities in durant ainstall frequency over most of Takwon.

Uncations Huang, W.-R.\*, P.-Y. Liu, Y.-H. Chang and C.-Y. Liu, 2020: Evaluation and Insplication of Exactline Control of Control of

Jang, W.-R.\*, Y.-H. Chang, and C.Y. Clo 2000. Evaluation an plication of Stellite Precipitation Products in Studying the Summer repitation Variations over Talwan. Remote Sens. 12, 347. ang, W.-R.\*, Y.-H. Chang and P.-H. Huang, 2019: Relationship betw.

y w.-w.-, t.-H. Chang and P.-H. Huang, 2019: Reli terannual Variations of Summer Convective Aftern y in Taiwan and SSTA(Niño3.4) during 1961-2012: techanisms, Scientific Reports, 9, 9978

More publications please refer: https://web.ntnu.edu.tw/~w

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**Structural Geology & Geomechanics** 

characterization of Taiwar mountain building proc and geothermal exploration

tion  $(\overline{V}_{2})$  and the diamal second  $(-\overline{T}_{2}V_{2})$  at 11 [T

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oon Rainfall

**Farth Science Education** 

Topographic Theta energy Topographic Theta energy maps of subject x for a quick comparison of two stated methods. (a) Results derived from the proposed EEMD-MHHS method. (b) Results derived from the Fourier based

The mediation effect

perceived behavio in marine environn

correspondence

uumcRittons Chou, Y.-M., C. Aubourg, E.-C. Yah, S.-R. Song, Y.-K. Lin, F. Humbert, X. Jiang, and T.-Q. Lee, [2020] The Magnetic Fabric of Gouge Minics the Co-selence Focal Mechanism of the Ci-Nei Earthquake (1999; Mar 7.6). Geophysical Research Lettres, Accepted manuscript online by 22 October 2020, DOI: 10.1039/2020.0016911.1 Yu-Ming Lai Assistant Professor ant of Earth Sciences Lab of Magmatic and Volcanic Proce ymlai@ntnu.edu.tw 13.03920000000111. U.y. Y.C., S.A. Spool, S. Tapuch, P.-L. Wang, E.-C. Yeb, Y.-J. Lin, J. MacDonaki, and C.M. John, (2018) Evolution of hot fluids in the Chingshal geothermal field inferred from orystal morphology and geochemical win data. Geothermics, 74, 305-318. Mondro, C.A., O Thehr, and E.-C. Yeb, (2017) Strain histories from the eastern Gentral Range of Tawanic. A rector of addrection through a collisional organ. Tectosophics, 706, 511.

## Background: PhD in Department of Geosciences, National Taiwan University, Taiwan

Department of Farth Sciences

analyses and using geochemical data.

Operations on X-ray Fluorescence (XRF), Scanning Electron Microscope (SEM),

tron Prohe Micro-Analyses (FPMA)

Energy Dispersive Spectrometer (EDS)

Laser Ablation Microprobe (LAM)-ICPMS

Techniques used in study

We study the island arc magnatism and volcanism processes in the Northern iuzon Arc (Talwan and Philippine) and the Wetern Sund-Banda Arc (Sumatra and Java Island, indonesia). Our researches are foccusing on igeneous geochemistry, ziron unnium-lead geochemical study and experimental petrology of the Cancolo volcanic Island rocks. We welcome students who want to visit our Jab of learning geochemical

Department of Earth Sciences **Molecular Astrophysics and Astrobiology** Research Focus: Search for prebiotically important complex organic molecules entimiess hearinging

Search for prebiotically important complex organic molecules (COMa) in page. — Anno valuations in the universe? Study of Salar System and interstittel correst. — Besides understanding of the origin and evolution of Salar System is ventrale. Study of Salar System is ventrale. South of Salar System is ventrale. Some is yourdism my possess subsurface occame. Are there there is yourdis habitable To how you have for file of there is the subsurface occame. Are there is ventral in the your barrow file?

trees exy works habitable ? Do they harbor life? **Telescopes used in study:** The Atacama Large Milimeter/Array (ALMA; world') largest ground-based observing facility), Submillimeter Array (SMA James Clerk NaveWI Telescope (CuTF), Submillimeter Telescope (SMT), and the Kitt Peak 12m (12M).

Yi-Jehng Kuan, Professor

Department of Earth Sciences Center of Astronomy and Gravitation ASIAA (Institute of Astronomy and

Astrophysics, Academia Sinica) kuan@ntnu.edu.tw Background: PhD in Astronomy, University of Illinois

at Urbana-Champaign, USA

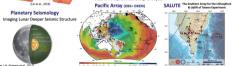
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### Department of Earth Sciences Planetary Seismology Lab

Patty Pei-Ying Lin, Assistant Professor, Dept. of Earth Sciences Ontnu.edu.tw Background: PhD in Geophysics. The University of Arizona Funding: Ministry of Science and Technology







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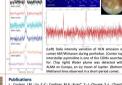
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Zircon U-Pb and Hf isotopic constraints on the magmat

Age, geochemical and isopper analysis in volcanic rocks from the Coastal Range of Taiwan: Implications for magma generation in the Northern Luzon Arc. Lithos, 2017, 272-273, 92-115.

and Oceanic Science, 2018, 29 (2), 153-190.

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 $\gamma \rightarrow 0$ 



Understanding magmatic processes: Geochemical and geochronological studies

.I. Field survey and sample

Coulson, I.M.; Lik S.B.; Tseng, W.-L

SB; Treng, W. -L; Milam, S. N. Ja, W. -H; Jin, Z.-Y. 2020, "ICMT Spectral and Continuum Imaging of Hyperactive Comet 449/Wirtsner", Astronomics Journal, 180, 182 Condiner, M.A.; Milam, S.N.; Bwer, N.; Bockel e-e-Morvan, D.; Roth, N.X.; Bergin, E.; Jehin, J.; Remijan, A.J.; Charrier, S.B.; Numma, M.J.; Boissier, J.; Crowister, J.; Paganisi, L.; Naun, Y.-J.; Us, D.C., 2020, "Jinusually High CO Abundance of the First Active Interface Comet", Asture. Astronomy, 6AB Jourdance of the First Active Interface Incomet", Nature. Astronomy, 6AB.

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# **Studying in NTNU**



https://youtu.be/wcW9QKBd1nQ



You can also check the students' studying experience here https://www.cos.ntnu.edu.tw/index.php/en/home-en/admission/meet-the-students/



# Studying in Dept. of Earth Sciences



https://www.dropbox.com/s/b4au69tyxdmqrqk/Introduction\_2023.pdf?dl=0



# How to apply

# 1) Am I qualified?

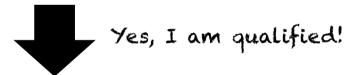
You need to satisfy the following conditions:

### Master's Program

Those who have graduated, or are expected to graduate, from a university by July 31 for fall admission and January 31 for spring admission that year.

### **Doctoral Program**

Those who have earned, or are expected to earn, a master's degree by July 31 for fall admission and January 31 for spring admission that year.



# 2) Check the deadline



I want to apply now!

	Application Period	Admission Notification**		
Fall semester 2023	October 3, 2022 - January 16, 2023*	April, 2023	September, 2023	
Spring semester 2024	June 1 - July 31, 2023	October, 2023	February, 2024	

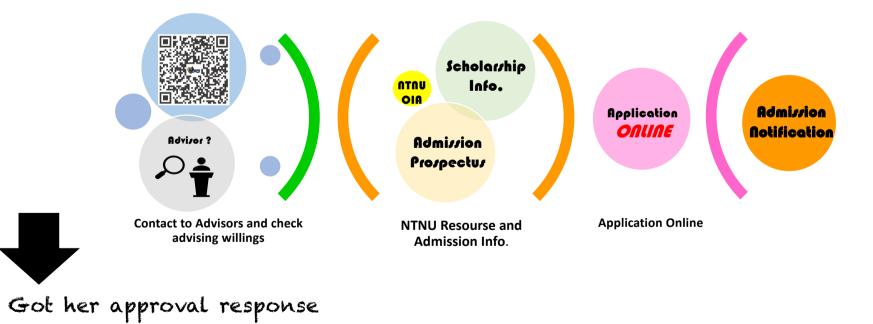


# How to apply

## 3) Contact the chairman

Please prepare (1) your CV (2) what field you are interested in (3) what other thing you'd like to know about this department.

### Email Prof. Kate Chen katepili@ntnu.edu.tw





# How to apply

# 4) Prepare the application





### Fill the online application form

https://bds.oia.ntnu.edu.tw/bds/en/apply/application/2022002

# Q: Can I apply for scholarship?

There are two main sources of scholarship for students enrolled into our departments. 1. NTNU International Student Scholarship





Information can be found here

https://bds.oia.ntnu.edu.tw/bds/en/web/scholarship



# Q: Can I apply for scholarship?

## 2. Taiwan Scholarship\_MOE (Ministry of Education) Taiwan Scholarship

### Amounts awarded:

-Master's program: a stipend of NT\$30,000 per month; maximum of 2 years. -Ph.D. program: a stipend of NT\$30,000 per month; maximum of 3 years.

### Application period:

February 1st until the end of March.

### How to apply:

Please contact the nearest ROC embassy, consulate, or representative office in your home country.

### \* Research assistant / teaching assistant

Once you decide your research topic and the supervisor, the monthly salary as a research assistant (RA) or teaching assistant (TA) is commonly paid by individual supervisor. The common monthly salary for master RA/TA is NT \$6000-10000, PhD is NT \$10000-40000.



# Q: How much it costs to live in Taipei?

### Tuition and Other Miscellaneous Fees (approx. annual rate)

Tuition for International Students will be supported by NTNU. Other Miscellaneous Fees for International Students:

National Taiwan Normal University Student Dormitory Housing fees

TWD\$25,930

TWD\$15,250

		Dormitory	Semester	Summer	Room Type
Insurance Fee	Health Insurance 200-300 USD Compulsory Insurance 15 USD	Dormitory No.1 (Male Students Dormitory No.1, Female Students Dormitory No.1, Female Students Dormitory No. 1	TWD\$5,950	TWD\$3,500	6-bed air-conditioned
Computer and Network Facilities Fee	40 USD	Female Students Dormitory No. 1 Female Students Dormitory No. 1 Branch 4-bed room	TWD\$8,930	TWD\$5,250	4-bed air-conditioned
On-Campus Dormitory (Utilities not included)	500-1,600 USD	Dormitory No.7 Chenglou Dormitory	TWD\$11,670	TWD\$6,860	4-bed air-conditioned suite
Off-Campus Housing (Individual rooms)	270 USD and up/per month	4-bed room Chenglou Dormitory 3-bed room	TWD\$14,880 TWD\$18,700	TWD\$8,750 TWD\$11,000	4-bed air-conditioned 3-bed air-conditioned
	300-350 USD/per month	Chenglou Dormitory 2-bed room	TWD\$22,670	TWD\$13,330	2-bed air-conditioned
		Dormitory No.2 4-bed room	TWD\$15,300	TWD\$9,000	4-bed air-conditioned
		Dormitory No.2 Male Students King Size 3-bed room	TWD\$20,400	TWD\$12,000	3-bed air-conditioned

Dormitory No.2 2-bed room



### Student Dormitory Application

https://www.ga.ntnu.edu.tw/dorm/form/112%E6%96%B0%E7%94%9F%20Dormi tory%20Application%20Schedule112.3.20.pdf



2-bed air-conditioned suite

2023.03.24 notice