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## EDUCATION

1993 Ph.D. Dept. of Geosciences, National Taiwan Univ., Taiwan ROC

1988 M.S. Dept. of Geosciences, National Taiwan Univ., Taiwan ROC

1984 B.A. Dept. of Geosciences, National Taiwan Univ., Taiwan ROC

## EMPLOYMENT

2020/01 – present	Director	RCEC, Academia Sinica, Taiwan ROC
2019/06 – present	Distinguished Research Fellow	RCEC, Academia Sinica, Taiwan ROC
2018/08 – present	Executive Secretary	Center for Sustainability Science, Academia Sinica, Taiwan ROC
2018/06 – present	Joint Appointment Research Fellow	Inst. of Earth Sciences, Academia Sinica, Taiwan ROC
2019/06 – present	Joint Appointment Professor	Dept. of Geosciences, National Taiwan University, Taiwan ROC
2012/08 – 2019/05	Distinguished Professor	Dept. of Geosciences, National Taiwan University, Taiwan ROC
2017/01 – 2020/03	Visiting Professor	Earth Observatory Singapore, Nanyang Technology Univ., Singapore
2014/03 – 2016/07	Director General	Dept. of Natural Sciences and Sustainable Development, Ministry of Science and Technology, Taiwan ROC
2012/08 – 2014/02	Director General	Dept. of Natural Sciences, National Science Council, Taiwan ROC
2011/08 – 2012/07	Chairperson	Dept. of Geosciences, National Taiwan University, Taiwan ROC
2003 – 2012/07	Professor	Dept. of Geosciences, National Taiwan University, Taiwan ROC
1997 – 2003	Associate Professor	Dept. of Geosciences, National Taiwan University, Taiwan ROC

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## HONORS & AWARDS

Outstanding Research Awards of National Science Council, ROC, 2011-2014  
Outstanding Research Awards of National Science Council, ROC, 2003-2006  
Annual Research Awards of National Science Council, ROC, 1995, 1996, 1997, 1999, 2000  
Award for Young Scientist, College of Science, NTU, 2002  
Outstanding Teaching Award of National Taiwan Univ., 1999, 2003, 2009  
Geological Society America (GSA) Fellow elected in 2008  
Merit Research Fellow, Ministry of Science and Technology, 2022

## PROFESSIONAL SERVICE

- 2017- : Member, Regional Advisory Committee, AOGS
- 2017- : Member, Publication Committee, AOGS
- 2017- : Member, National Committee of Future Earth, Taipei
- 2016- : Coordinator, Thematic Program Office for Collaboration Research Action: Disaster Risk Reduction and Resilience, Belmont Forum
- 2016- : Council member, Chinese Taipei Geophysical Society

## RESEARCH INTEREST (10 ~ 15 lines ; 內容同時呈現於 RCEC 網頁個人介紹頁)

- (1) Paleoclimate and environmental changes by isotope geochemistry;
- (2) Earth systems and sustainability sciences;
- (3) Geochronology developments and their applications;
- (4) Kinematics of seismogenic faults and seismic hazard mitigation.

## RESEARCH HIGHLIGHTS (同時呈現於 RCEC 網頁 ; 簡述近期重要研究 , 每則 5~10 lines)

### 1. Precipitation response to Heinrich Event-3 in the northern Indochina as revealed in a high-resolution speleothem record

The Heinrich Event (HE), a millennial-scale cold event in the North Atlantic, is characterized by the occurrence of a large amount of coarse terrigenous grains in marine sediments. There are 7 HEs in the past 70 thousand years (HE-6 to HE-0). Among HEs, HE-3 and HE-6 have been categorized as unusual events due to lower proportions of lithic grains found in their corresponding sedimentary layers. In tropical Asia, HE-3 manifestations prominently appear in proxy records from China, Myanmar, northern Borneo, and India. It supports the climatic link between the low latitudes and the North Atlantic. However, the mechanism remains challenging because monsoon intensity may respond to HEs in different magnitudes.

Here, we report a new dataset of speleothem  $\delta^{18}\text{O}$  from northwestern Vietnam, which covers the duration of the HE-3 with decadal scale resolution. The  $\delta^{18}\text{O}$  data implies a pronounced excursion in precipitation beginning at around 30.8 thousand years ago (ka), reaching the minimum at 30.3 ka, and then turning to increase in precipitation at 30.2 ka, and finally returning to a higher level at 29.5 ka. It shows a gradual, discontinuous onset and termination of altered

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conditions with steps inferred to be on the order of several hundred years. This contrasts to the abrupt HE-3 onset and termination observed by previous studies in Asian monsoon region. We used a coupled slab ocean model (CAM3) to evaluate effects of different degrees of cooling associated with glacial boundary conditions. Magnitudes of cooling ranged from 6 °C and 10 °C (low and high scenarios respectively) around the British Isles relative to the control simulation. The simulated summer (June-July-August) precipitation near northwestern Vietnam presents an ~10% decline which resulted from a southward shift of Indian Ocean's warm pool and summer ITCZ by the cooling in the North Atlantic. (Nguyen et al. 2022)

## **2. Synorogenic extension and extrusion in southern Taiwan**

Extensional deformation is documented in many contractional orogenic belts, which are characterized by high topography, thickened crust, and synorogenic extensional structures at high elevations or on steep topographic slopes. The direction of extension is generally perpendicular or parallel to the orogen. In southern Taiwan, those high rocks in the core of the orogenic belt are dominated by the extension, whereas the lower is dominated by the contraction. In contrast, the mountain heights and crust thickness in southern Taiwan are lower and thinner than in those classic orogens. In addition, the direction of extension is oblique to the orogen rather than orthogonal or parallel to the orogen. These observations suggest a more complicated tectonic process may be responsible for the extension in the core of southern Taiwan. This study integrates late-stage structures and their palestress inversion, with GPS and earthquake focal mechanisms to assess different hypotheses for the origin of synorogenic normal faults in the study area. This study further proposes a southwestward extrusion model in which the lateral and vertical movement of the lower crust in southern Taiwan accommodates the shortening between the obliquely colliding Peikang High and the Luzon Arc. The northeast extension normal faults in the upper crust can be interpreted as to accommodate the lateral and vertical movement of the lower crust in the southern Central Range. This study infers that this southwestward extrusion process may be younger than 0.5 Ma based on thermochronological result and the proposed onset of extrusion in southwest Taiwan is late Pleistocene. (Hsu et al. 2022)

## **REPRESENTATIVE PUBLICATIONS** (\*: corresponding author)

1. Kuo, Y.T., Ayoub, F., Leprince, S., **Chen, Y.G.\***, Avouac, J.P., Shyu, J.B.H., Lai, K.Y., Kuo, Y.J. (2014). Coseismic thrusting and folding in the 1999 Mw 7.6 Chi-Chi Earthquake: A high resolution approach by aerial photos taken from Tsaotun, Central Taiwan. *J. Geophys. Res. - Sol. Ea.*, 119(1), 645-660. **(IF: 3.350, ▲: 8)**
2. Simoes, M.\*, **Chen, Y.G.**, Shinde, D. P., Singhvi, A. K. (2014). Lateral variations in the long-term slip rate of the Chelungpu fault, Central Taiwan, from the analysis of deformed fluvial terraces. *J. Geophys. Res. - Sol. Ea.*, 119(4), 3740-3766. **(IF: 3.350, ▲: 7)**
3. Huang, S.Y.\*, **Chen, Y.G.**, Burr, G.S., Jaiswal, M.K., Lin, Y.N., Yin, G., Liu, J., Zhao, S., Cao, Z. (2014). Late Pleistocene sedimentary history of multiple glacially dammed lake episodes along the Yarlung-Tsangpo River, southeast Tibet. *Quaternary Research*, 82(2), 430-440. **(IF: 2.195, ▲: 26)**

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4. Chen, C.Y., Lee, J.C.\*, **Chen, Y.G.**, Chen, R.F. (2014). Campaigned GPS on Present-day crustal deformation in northernmost Longitudinal Valley preliminary results, Hualien Taiwan. *TAO*, 25(3), 337-357. (IF: 0.752, ▲: 15)
5. Yang, T.N., Lee, T.Q., Lee, M.Y., Huh, C.A., Meyers, P.A.\*, Lowemark, L., Wang, L.C., Kao, W.Y., Wei, K.Y., Chen, R.F., Chen, H.F., Chen, S.H., Wu, J.T., Shiau, L.J., **Chen, Y.G.**, Hsieh, Y.C. (2014). Paleohydrological changes in northeastern Taiwan over the past 2ky inferred from biological proxies in the sediment record of a floodplain lake. *PPP*, 410, 401-411. (IF: 2.578, ▲: 11)
6. Le Béon, M., Suppe, J., Jaiswal, M.K., **Chen, Y.G.**, Ustaszewski, M.E. (2014) Deciphering cumulative fault slip vectors from fold scarps: Relationships between long-term and coseismic deformations in central Western Taiwan. *J. Geophys. Res.-Sol. Ea.*, 119(7), 5943-5978. (IF: 3.350, ▲: 23)
7. Kirstein, L.A. \*, Carter, A., **Chen, Y.G.** (2014) Impacts of arc collision on small orogens: new insights from the Coastal Range detrital record, Taiwan. *Journal of the Geological Society*, 171(1), 5-8. (IF: 3.037, ▲: 9)
8. Hsu, Y.J.\*, Chang, Y.S., Liu, C.C., Lee, H.M., Linde, A.T., Sacks, S.I., Kitagawa, G, **Chen, Y.G.** (2015). Revisiting borehole strain, typhoons, and slow earthquakes using quantitative estimates of precipitation-induced strain changes. *J. Geophys. Res. - Sol. Ea.*, 120(6), 4556-4571. (IF: 3.350, ▲: 23)
9. Yu, T.L., Wang, B.S., You, C.F.\*, Burr, G. S., Chung, C.H., **Chen, Y.G.** (2015). Geochemical effects of biomass burning and land degradation on Lanyu Islet, Taiwan. *Limnology and Oceanography*, 60(2), 411-418. (IF: 3.383, ▲: 5)
10. Wu, T.S.\*, Jain, M., Guralnik, B., Murray, A.S., **Chen, Y.G.** (2015). Luminescence characteristics of quartz from Hsuehshan Range (Central Taiwan) and implications for thermochronometry. *Radiation Measurements.*, 81, 104-109. (IF: 1.442, ▲: 7)
11. Chen, G.H. \*, Xu, X.W., Wen, X.Z., **Chen, Y.G.** (2016). Late Quaternary Slip-rates and Slip Partitioning on the Southeastern Xianshuihe Fault System, Eastern Tibetan Plateau. *Acta Geologica Sinica-English Edition.*, 90(2): 537-554. (IF: 1.708, ▲: 17)
12. Hsu, W.H., Byrne, T.B., Ouimet, W., Lee, Y.H., **Chen, Y.G.**\*, Soest, M., Hodges, K. (2016). Pleistocene onset of rapid, punctuated exhumation in the eastern Central Range of the Taiwan orogenic belt. *Geology*, 44(9) 719-722. (IF: 4.635, ▲: 41)
13. Kuo, Y.T., Ku, C.S., **Chen, Y. G.**\*, Wang, Y., Lin, Y.N.N., Chuang, R.Y., Hsu, Y.J., Taylor, F.W., Huang, B.S., Tung, H. (2016). Characteristics on Fault coupling along the Solomon megathrust based on GPS observations from 2011 to 2014. *Geophys. Res. Lett.*, 46(13) 5819-8526. (IF: 4.212, ▲: 5)
14. Chang, C.C.\*, Burr, G. S., Jull, A.J.T., Russell, J.L., Biddulph, D., White, L., Prouty, N.G., **Chen, Y.G.**, Shen, C.C., Zhou, W.J., Lam, D.D. (2016) Reconstructing surface ocean circulation with <sup>129</sup>I time series records from corals. *J. Environ. Radioact.* 165, 144-150. (IF: 2.310, ▲: 17)
15. Chao, W.A.\*, Wu, Y.M., Zhao, L., Chen, H.E., **Chen, Y.G.**, Chang, J.M., Lin, C.M. (2017). A first near real-time seismology-based landquake monitoring system. *Scientific Reports* 7, srep 43510. (IF: 4.259, ▲: 20)

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16. Yu, T.L., Wang, B.S., Shen C.C.\*, Wang, P.L. Frank T.Y., Burr, G.S., **Chen, Y.G.** (2017) Improved analytical techniques of sulfur isotopic composition in nanomole quantities by MC-ICP-MS. *Analytica Chimica Acta*, 988, 34-40. (IF: 4.95, ▲: 15)
17. Fellin, M.G.\*, Chen, C.Y., Willett, S.D., Christl., M., **Chen, Y.G.** (2017). Erosion rates across space and timescales from a multi-proxy study of rivers of eastern Taiwan. *Global and Planetary Change*, 157,174-193. (IF: 3.915, ▲: 20)
18. Chang, Q., Lee, J.C.\*, Hunag, J.J., Wei, K.Y., **Chen, Y. G.**, Byrne, T. B. (2018). Identifying the source of fluvial terrace deposits using XRF scanning and Canonical Discriminant Analysis: A case study of the Chihshang terraces, eastern Taiwan. *Geomorpholog.*, 308, 204-214. (IF: 2.958, ▲: 0)
19. Ku, C.S.\*, Kuo, Y.T., Chao, W.A., You, S.H., Huang, B.S., **Chen, Y.G.**, Taylor, F.W., and Wu, Y.M. (2018). "A First-Layered Crustal Velocity Model for the Western Solomon Islands: Inversion of the Measured Group Velocity of Surface Waves Using Ambient Noise." *Seismological Res. Lett.*, 89, 2274-2283. (IF: 3.734, ▲: 4)
20. Chen, C.T.\*, Chan, Y. C., Beyssac, O., Lu, C.Y., **Chen, Y.G.**, Malavieille, J., Kidder, S.B., Sun, H.C. (2019). "Thermal History of the Northern Taiwanese Slate Belt and Implications for Wedge Growth During the Neogene Arc-Continent Collision " *TECTONICS*. 38(9) 3335-3350 (IF: 3.975, ▲: 5)
21. Nguyena, D.C., **Chen, Y.G.\***, Chiang, H.W.\*, Shen, C.C., Wang, X., Doan, L.D., Yuan, S., Lone, M.A., Yu, T.L., Lin, Y., Kuo, Y.T. (2020) A decadal-resolution stalagmite record of strong Asian summer monsoon from northwestern Vietnam over the Dansgaard–Oeschger events 2–4. *J. Asian Earth Sci.: X*, 3, 100027 (IF: 2.988, ▲: 5)
22. Wang, L.C.\*, Chou, Y.M., Chen, H.F., Chang, Y.P., Chiang, H.W., Yang, T.N., Shiau, L.J., **Chen, Y.G.** (2021). Paleolimnological evidence for lacustrine environmental evolution and paleo-typhoon records during the late Holocene in eastern Taiwan. *J. Paleolimnol*, 68, 7-23 (IF:2.265, ▲: 22)
23. Nguyen, D.C., Lee, S.Y., **Chen, Y.G.\***, Chiang, H.W., Shen, C.C., Wang, X.F., Lam, D.D., Lin, Y. (2022). Precipitation response to Heinrich Event-3 in the northern Indochina as revealed in a high-resolution speleothem record. *J. Asian Earth Sci.: X*, 7, 100090 (IF:3.374, ▲: 1)
24. Wang, Y., Lin, Y.N.\*, Ota, Y., Chung, L.H., Shyu, J.B.H., Chiang, H.W., **Chen, Y.G.**, Hsu, H.H., Shen, C.C. (2022). Mud diapir or fault-related fold? On the development of an active mud-cored anticline offshore southwestern Taiwan. *Tectonics*, 41(9), e2022TC007234 (IF:5.261, ▲: 1)
25. Lin, K.\*, Shen, C.C., Duan, W., Tan, L., Kong, X., Lee, S.Y., **Chen, Y.G.**, Wang, X. (2022). Early anthropogenic impacts on the Indian summer monsoon induced by land-use and land-cover changes. *J. Geophys. Res. Atmos.*, 127(18), e2022JD036754 (IF:5.217, ▲: 0)
26. Hsu, W.H., Byrne, T.B., Lewis, J.C., **Chen, Y.G.\***, Yeh, P.Y. (2022). Synorogenic extension and extrusion in southern Taiwan. *Tectonophysics*, 840, 229562 (IF:3.66, ▲: 0)

Others (Invited Talks · Keynote speech et al.)

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### **Invited Talks**

- 2017, Invited speaker, CRA: Disaster Risk Reduction and Resilience, Belmont Forum, Asian-Pacific Info-Day, Taipei
- 2017, Invited speaker, Mega-thrust Fault in Subduction Zones, Solomon Islands, Inst. Crustal Dynamics, CEA, Beijing
- 2018, Invited speaker, Collaborative research projects: meteorology and earthquake/tsunami early warning in Solomon Islands and related educational opportunities, Solomon Islands National University, Honiara
- 2018, Invited speaker, An opportunity: the developing call of CRA, Disaster Risk Reduction and Resilience, 2018 AOGS, Honolulu
- 2018, Invited speaker, Introduction to the Belmont Forum and its mission, GLP, Taipei
- 2018, Invited speaker, From Science to Sustainability: by Cases of Global Change and Devastating Disaster, RCEC, Academia Sinica
- 2019, Invited Keynote, Technology for Disaster Reduction: from Past to Future, Outcome Demonstration Symposium for Program on Applying Science and Technology for Disaster Reduction, Executive Yuan, Taiwan ROC
- 2019, Invited Keynote, Building Sustainable Society by Using Information and Communication Technology: Lessons from Disaster Management, PNC, Singapore
- 2020, Invited Talk, Facing post-COVID 19 challenges on geosciences from the perspectives of CGU in Taiwan, JpGU
- 2020, Invited Lecture, Environmental Aspects in Sustainability Sciences, Dept. Geoscience, National Taiwan Univ
- 2020, Invited Lecture, Networking and Opportunities for the Global Sustainability, National Tung-Hua Univ
- 2020, Invited Lecture, Global Warming, Environmental Change, and Sustainability, National Chung-Cheng Univ
- 2021, Invited Lecture, Sustainability Science in our Digital Future, National Central Univ.
- 2022, Invited Lecture, New Technology Development under Global Warming: to Emit and to Capture, National Museum of Natural Science.