



Climate Physics and Chemistry

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Course website:

<http://www.pku-atmos-acm.org/acmCourse.php/#Climate>



Goals

- **Introduce basic scientific knowledge about climate and climate change**
- **Discuss physical and chemical mechanisms behind climate equilibrium, climate change, and human contributions**
- **Stimulate interests in seeking solutions to help mitigate climate change and improve adaptation**

Contents

Part 1:

- Introduction
- Radiation (1-D)
- Thermodynamics (1-D)
- Climate equilibrium (1-D)

Part 2:

- Carbon cycle
- Climate-chemistry interactions
- Earth system modeling
- Paleoclimate and planetary atmospheres

Scoring (成绩)

- In-class performance: **20%**, including attendance, Q&A, quiz, discussion
- Homework: **40%** (*two* sets + *one* oral presentation of topic related to homework)
- Final exam: **40%**
- Individual requests to change scores are discouraged and will not succeed in general

Scoring

作业:

两个部分分别出题，内容为简单模型实验，部分工作需要编程。可以跟教师、同学讨论，但必须独立设计试验、计算、作答。作业不一定有标准答案，重点是充分说明你的想法和推理依据。

学期末每个同学自选其中一个主题的作业延伸探索，并做简短报告。

作业、报告、考试如果发现有任何抄袭舞弊，一律零分计算并通知学校。

References (参考文献)

- Hartmann, D. L. Global Physical Climate. San Diego, CA: Academic Press, 1994, p. 408. ISBN: 9780123285300.
- Goody, R., Principles of Atmospheric Physics and Chemistry, Oxford University Press, New York, USA, 324 pp. ISBN: 0-19-509362-3
- Wunsch, C., Boyle, E., and Emanuel, K., Climate Physics and Chemistry, [MIT Open Course](#).
- IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekci, R. Yu and B. Zhou (eds.)]. Cambridge University Press. (<https://www.ipcc.ch/report/ar6/wg1>)
- Seinfeld, J. H., and Pandis, S. N., Atmospheric Chemistry and Physics: from Air Pollution to Climate Change, 2nd edition, J. Wiley, New York, USA, 1232 pp. ISBN: 9780471720188

Office Hour

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