

# 科技寫作(Scientific Writing)



Week 1 (Sept. 08 – Sept. 12)

課程介紹

# 寫作經驗

- 已接收期刊論文182篇(一作27篇、二作或通訊作者27篇)

**PI of 15 accepted ALMA proposals**

**Co-I of 98 accepted ALMA proposals**

(Number of my participated proposals can be roughly estimated based on the over-subscription rate. I have failed proposals too.)

**I have been active in three science categories (with journal publications):**

20: Galaxies and galactic nuclei

31: Interstellar medium, star formation and astrochemistry

41: Circumstellar disk, exoplanets and the solar system

**SMA-T TAC chair in 2020-2022**

**ESO Fellow selection committee member in 2017**

# Why Write?

- <周易・繫辭>

鼓天下之動者，存乎辭。

- 南朝-劉勰<文心雕龍・原道>

道沿聖以垂文，聖因文而明道。

# Why Write?

- Paul Graham – Write and write-nots (<https://pse.is/84mx26>)

I'm usually reluctant to make predictions about technology, but I feel fairly confident about this one: in a couple decades there won't be many people who can write.

One of the strangest things you learn if you're a writer is how many people have trouble writing. Doctors know how many people have a mole they're worried about; people who are good at setting up computers know how many people aren't; writers know how many people need help writing.

The reason so many people have trouble writing is that it's fundamentally difficult. **To write well you have to think clearly, and thinking clearly is hard.**

And yet writing pervades many jobs, and the more prestigious the job, the more writing it tends to require.

These two powerful opposing forces, the pervasive expectation of writing and the irreducible difficulty of doing it, create enormous pressure. This is why eminent professors often turn out to have resorted to plagiarism. The most striking thing to me about these cases is the pettiness of the thefts. The stuff they steal is usually the most mundane boilerplate — the sort of thing that anyone who was even halfway decent at writing could turn out with no effort at all. Which means they're not even halfway decent at writing.

Till recently there was no convenient escape valve for the pressure created by these opposing forces. You could pay someone to write for you, like JFK, or plagiarize, like MLK, but if you couldn't buy or steal words, you had to write them yourself. And as a result nearly everyone who was expected to write had to learn how.

Not anymore. AI has blown this world open. Almost all pressure to write has dissipated. **You can have AI do it for you, both in school and at work.**

The result will be a world divided into writes and write-nots. There will still be some people who can write. Some of us like it. But the middle ground between those who are good at writing and those who can't write at all will disappear. Instead of good writers, ok writers, and people who can't write, **there will just be good writers and people who can't write.**

Is that so bad? Isn't it common for skills to disappear when technology makes them obsolete? There aren't many blacksmiths left, and it doesn't seem to be a problem.

**Yes, it's bad. The reason is something I mentioned earlier: writing is thinking.** In fact there's a kind of thinking that can only be done by writing. You can't make this point better than Leslie Lamport did:

- **If you're thinking without writing, you only think you're thinking. So a world divided into writes and write-nots is more dangerous than it sounds. It will be a world of thinks and think-nots. I know which half I want to be in, and I bet you do too.**

**This situation is not unprecedented. In preindustrial times most people's jobs made them strong. Now if you want to be strong, you work out. So there are still strong people, but only those who choose to be.**

**It will be the same with writing. There will still be smart people, but only those who choose to be.**

# How do we select employee?

- Reading your Cover Letter + CV
- Interview (I can see whether or not you are thinking)  
謹慎思考是一種習慣。常態寫作可幫助維持這種習慣。

# 寫作基本原則

南朝-劉勰<文心雕龍·徵聖>

泛論君子，則云「情欲信，辭欲巧。」此修身貴文之徵也。  
然則志足而言文，情信而辭巧，迺含章之玉牒，秉文之金科也。

...

...

文成規矩，思合符契。或(1)簡言以達旨，  
或(2)博文以該情，  
或(3)明理以立體，  
或(4)隱義而藏用。

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...

...

文成規矩，思合符契。或(1)簡言以達旨(abstract)，  
或(2)博文以該情(introduction)，  
或(3)明理以立體(results, discussion)，  
或(4)隱義而藏用(applications)。

# 寫作基本原則

## <周易>

辨物正言，斷辭則備 (即論述要有所本，結論才會有predicting power)

商周時期為義理易，與西漢以後迷信的數數易本質不同。

## <尚書>

辭尚體要，弗為好異



# 寫作基本原則

南朝-劉勰<文心雕龍·宗經> -> 寫作請參考經典文章，多讀文獻

故文能宗經，體有六義：

一則情深而不詭，二則風清而不雜，三則事信而不誕，

四則義直而不回，五則體約而不蕪，六則文麗而不淫

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不要過分追求標新立異 (e.g., neutrino超過光速, etc)，  
對於marginal detection謹慎

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重視主旨跟邏輯，不要扯些不相干的事  
(常出現在introduction section)

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重視客觀結果

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重視邏輯，盡可能使用單向邏輯，不要產生loop(s)

南朝-劉勰<文心雕龍·風骨>

結言端直，則文骨成焉

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重視邏輯，盡可能使用單向邏輯，不要產生loop(s)

南朝-劉勰<文心雕龍·附會> -> 重視文章整體佈局，全面安排，  
研究結果與結論與introduction及方法呼應

何謂附會，謂總文理，統首尾，定與奪，合涯際，  
彌綸一篇，使雜而不越者也。

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四則義直而不回，五則體約而不蕪，六則文麗而不淫

簡短，但不要省話到變成沒內容，  
或是使人難以看懂或是復現結果

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四則義直而不回，五則體約而不蕪，六則文麗而不淫

不要用複雜的文法，如層層套疊的子句。

非必要不要使用代名詞(e.g., it, they, this, that, etc)！！！！



# 寫作基本原則

南朝-劉勰<文心雕龍·明詩> -> 多練習！！！！

然詩有恆裁，思無定位，隨性適分，鮮能圓通。  
若妙識所難，其易也將至。乎之為易，其難也方來。

南朝-劉勰<文心雕龍·體性> -> 找合適的文章模仿其寫作手法  
但不要抄內容！！！！

故宜摹體以定習，因性以練才。

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南朝-劉勰<文心雕龍·風骨> -> 找合適的文章模仿其寫作手法  
但不要抄內容！！！！

若夫熔鑄經典之範，翔集子史之術，洞曉情變，曲昭文體，  
然後能孚甲新意，雕畫其辭。  
昭體故意新而不亂，曉變故辭奇而不黷。  
若骨采未圓，風辭未練，而跨略舊規，馳驚新作，雖獲巧意，  
危敗亦多，豈空結奇字，紕繆而成經矣？

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但不要抄內容！！！！

南朝-劉勰<文心雕龍·時序> -> 不要模仿過時的寫作！！！！

文變染乎世情，興廢繫乎時序

# Benchmark

1. 靜置初稿兩三週，回頭再讀，看是否有變成看不懂的地方
2. 把稿給同學或同事看，看是否對方能輕易讀通
3. 收個學生，revise他的文章，見不賢而內自省

# What is Scientific Writing

- 瞄準特定讀者群
- 具特定目的
  1. 保證科學研究結果可再現
  2. 傳遞概念、引導領域研究

故具有特定體裁格式、  
重視效率(所有的句子與圖皆要有目的性，避免隨性地堆砌資訊)  
、避免重複與抄襲

# 課程規劃(Syllabus)

- 1. (Sept. 08 - Sept. 12): 課程介紹、  
[Overleaf](<https://www.overleaf.com/>) [get help with chatgpt],  
[grammarly](<https://app.grammarly.com/>) 介紹
- 2. (Sept. 15 - Sept. 19): 推薦信(recommend letter)
- 3. (Sept. 22 - Sept. 26): 博士班/博後申請(Ph.D/Postdoc position application)
- 4. (Sept. 29 - Oct. 03): 會議海報(poster) · Abstract · 口頭報告
- 5. (Oct. 06 - Oct. 10): 國慶放假
- 6. (Oct. 13 - Oct. 17): 獎項及其它資源申請(Award and proposal for other resources)
- 7. (Oct. 20 - Oct. 24): 光復節放假
- 8. (Oct. 27 - Oct. 31): 期中報告
- 9. (Nov. 03 - Nov. 07): 論文寫作構想及實作論文大綱(Concept and breaking down the problem)  
(c.f. [Simon Peyton Jones's speech at Microsoft Research](<https://www.youtube.com/watch?v=WP-FkUa0cOM>))
- 10. (Nov. 10 - Nov. 14): 論文大綱展示
- 11. (Nov. 17 - Nov. 21): 作圖技巧, caption!!
- 12. (Nov. 24 - Nov. 28): 圖與results section寫作
- 13. (Dec. 01 - Dec. 05): 討論
- 14. (Dec. 08 - Dec. 12): 結論與introduction section
- 15. (Dec. 15 - Dec. 19): 期末報告
- 16. (Dec. 22 - Dec. 26): 期末報告

# 評分(Assessment)

- 期中報告35%
- 期末報告50%
- 課堂參與15%

# 分組(Grouping)

- 3 people per group
- Try to stay with people in the same research area



# 寫作工具

- LaTeX
  - Pro : portable and manageable, easy to type Equations
  - Con: hard to learn (not anymore a problem thanks to Google and AI)
- Word or other platform
  - Pro : easy to use
  - Con: not so portable, not necessarily free,  
hard to maintain the format, hard to type equations
- Overleaf (<https://www.overleaf.com/>)
- Grammarly (<https://app.grammarly.com/>)

# ChatGPT (?) and Grammarly-AI

- Use ChatGPT to resolve problems with LaTeX
- Use Grammarly to do spell check and to resolve grammar errors.
- Use Grammarly to polish your language

Do **NOT** use AI to write the whole sentence or paragraph.  
Do **NOT** let AI take over the logic of your writing.