

# RANDOM WALKS AND OXIDATION



# Early Questions



**Hole here**

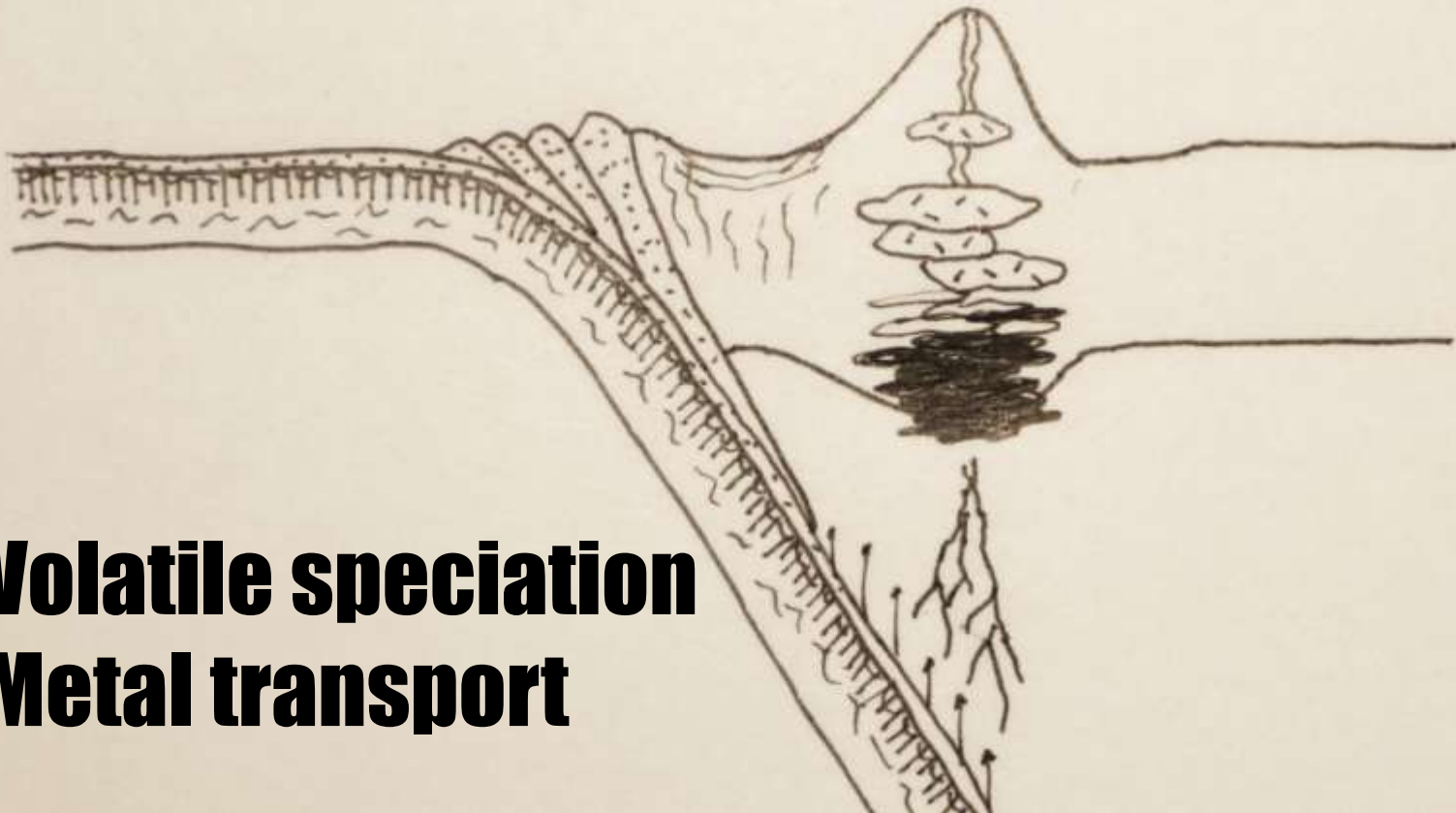
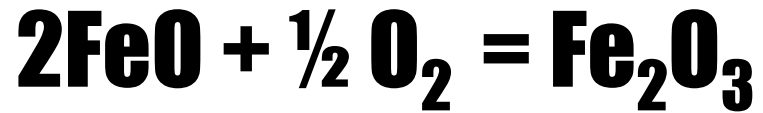
# Searching for questions

Me

Bottle  
of topics

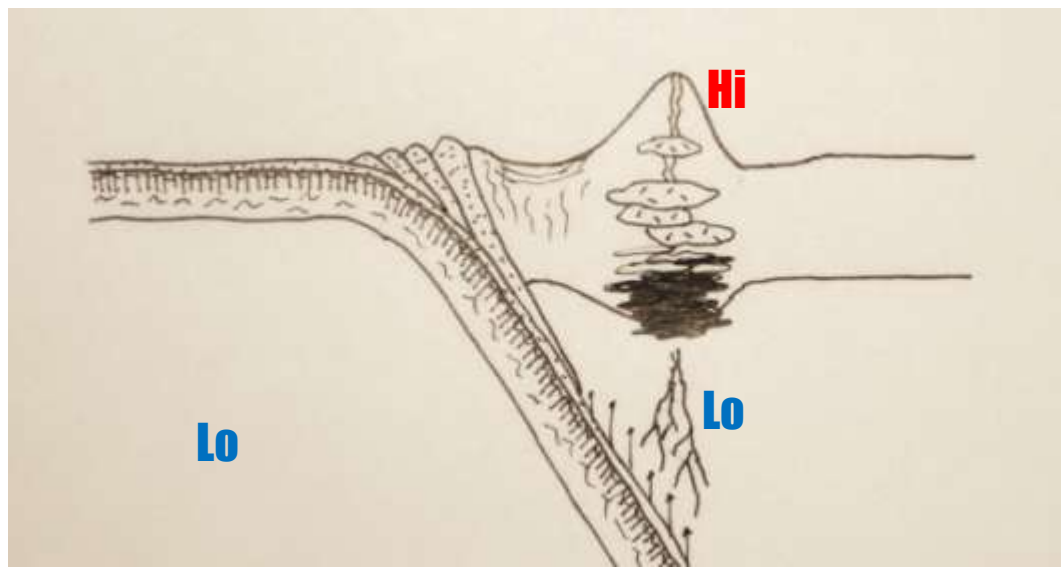
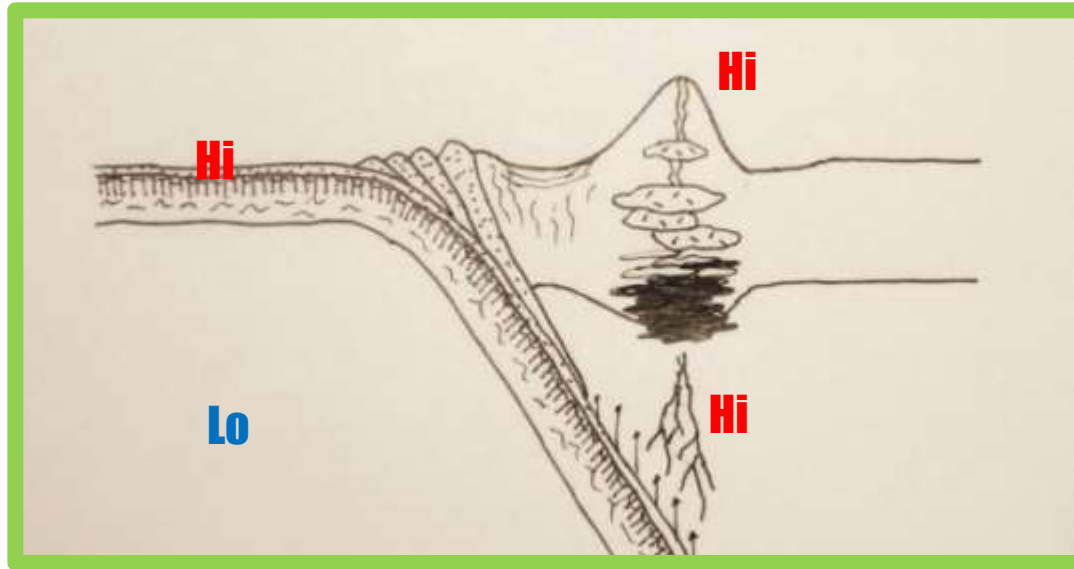


**What is the  $fO_2$  of arcs?**

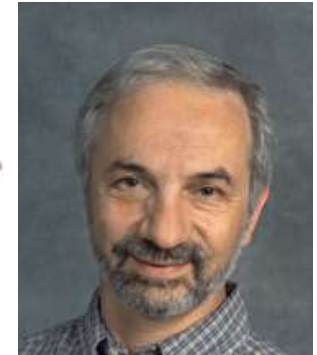
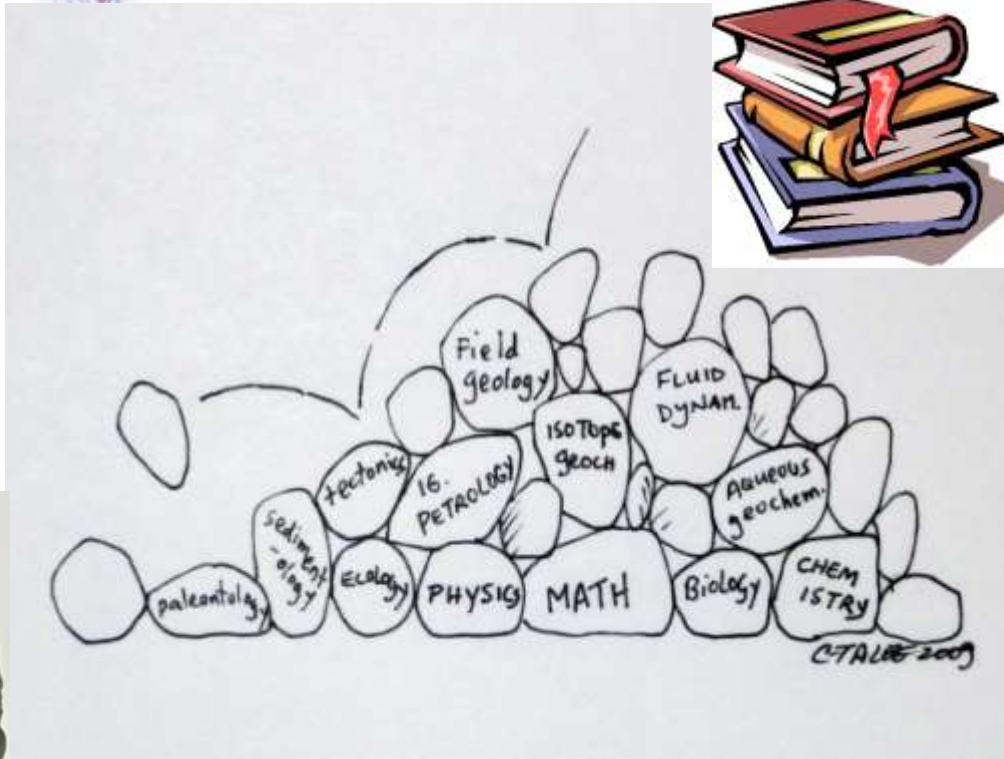
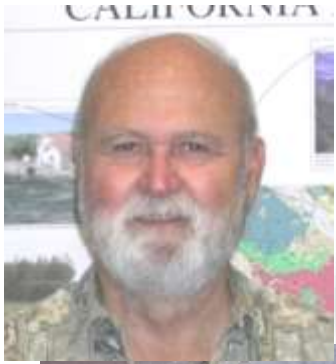


- **Volatile speciation**
- **Metal transport**

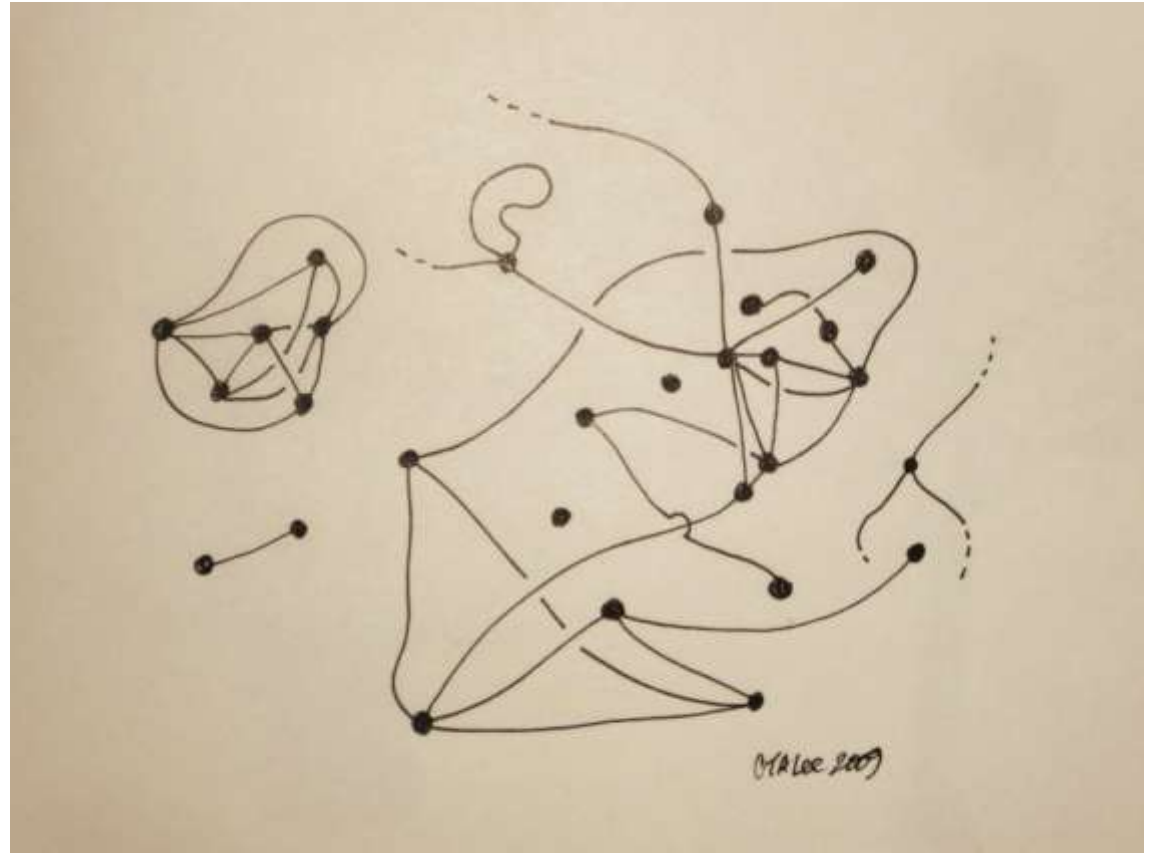
# What is the $fO_2$ of arc mantle and how does the $fO_2$ of arc magmas evolve?



# Building Knowledge



# Understanding - Landscape of Knowledge



**“A ppm of heresy a day keeps the doctor away”**



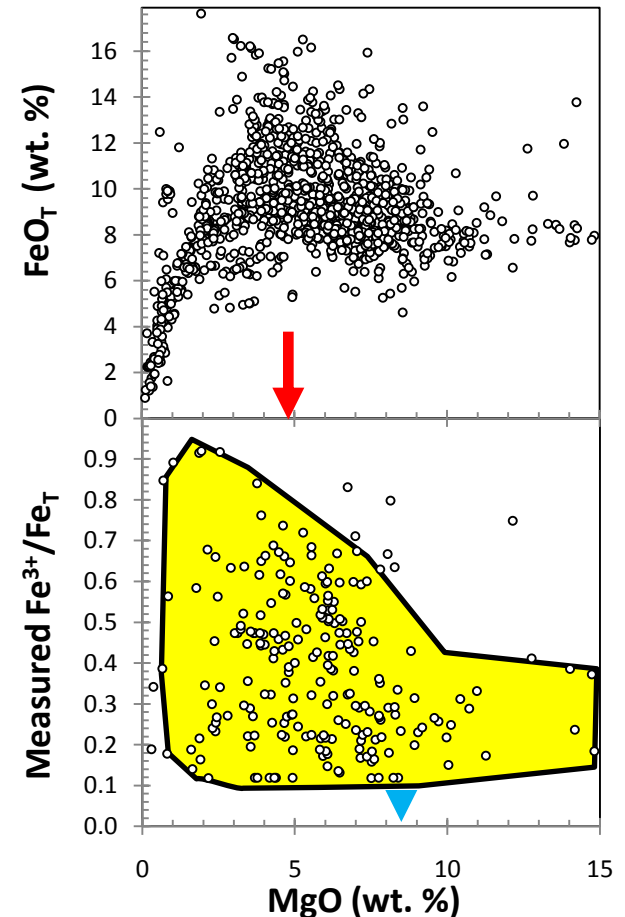
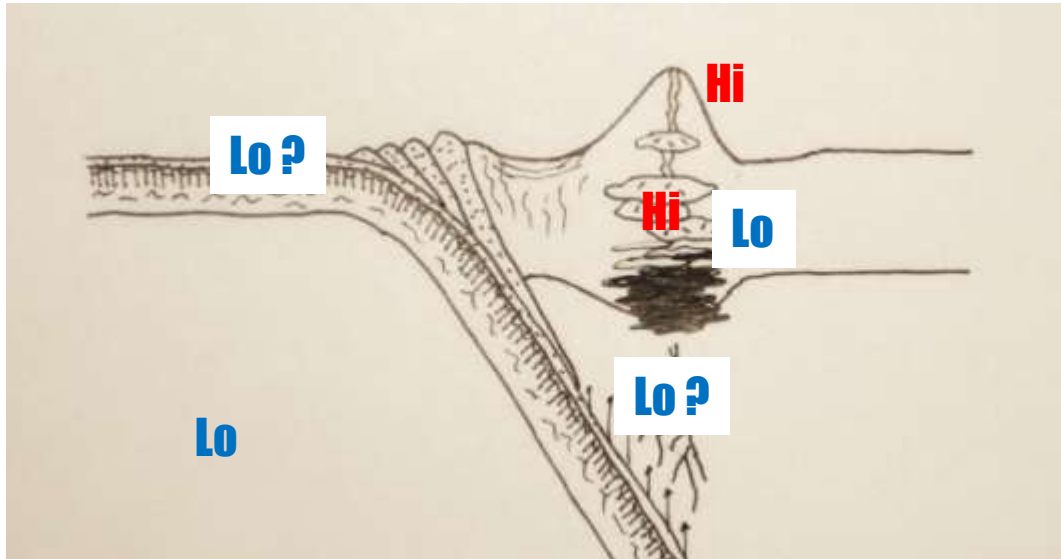
Peter Luffi



# Paradigm: Arc mantle has hi fO<sub>2</sub>

## Problems?

- not all arc magmas are oxidized
- not all material subducted is oxidized
- oxidation and reduction are coupled

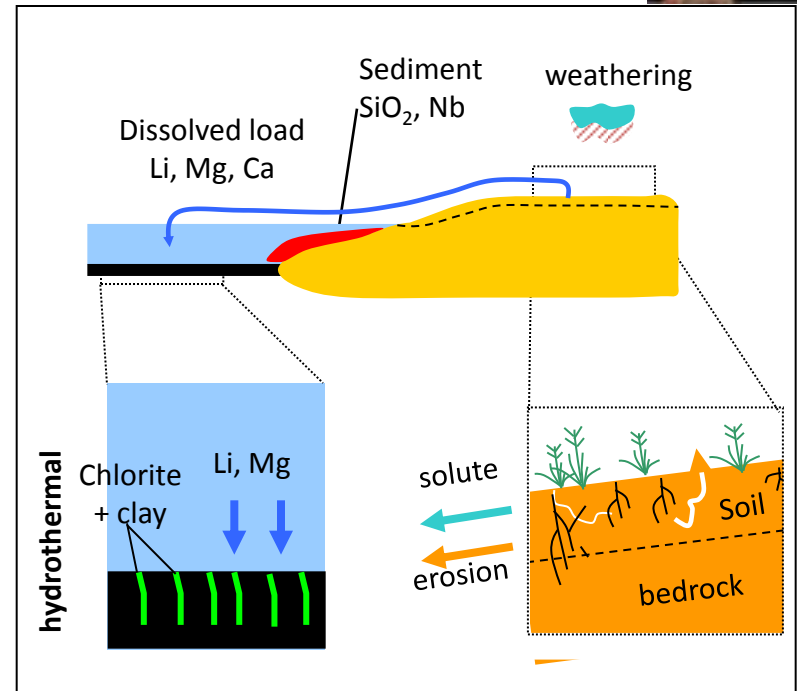
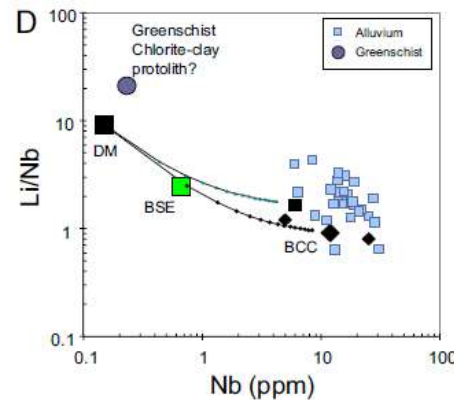
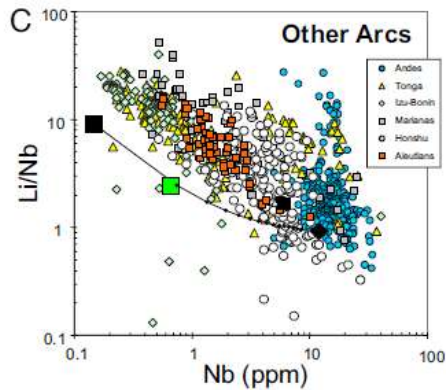
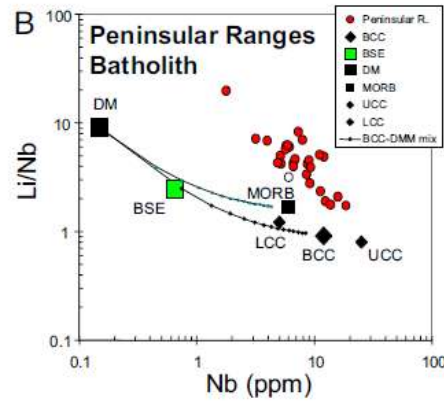
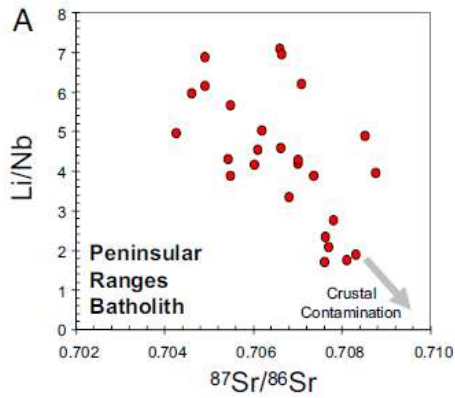
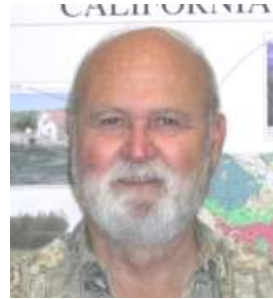


# Investing in serendipity



# Regulating continent growth and composition by chemical weathering

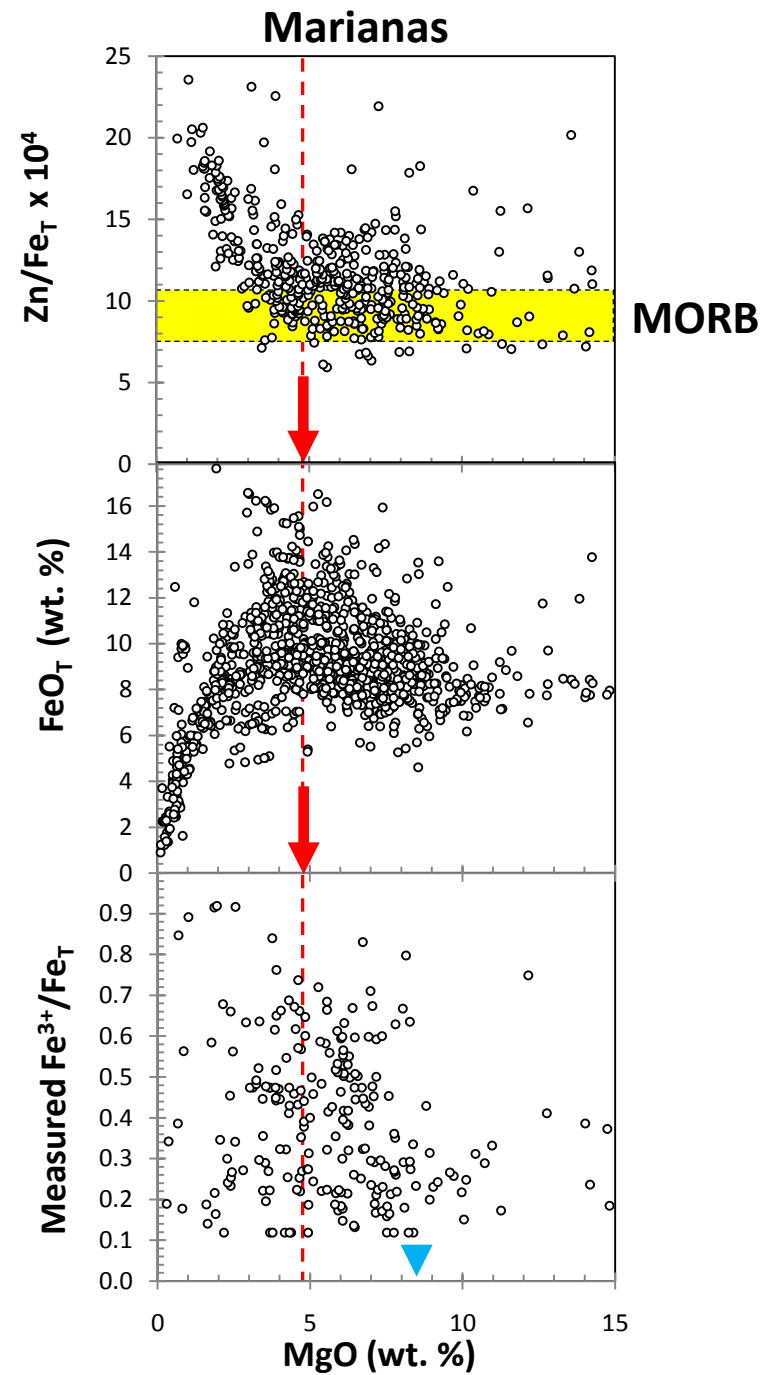
Cin-Ty Aeolus Lee\*<sup>†</sup>, Douglas M. Morton<sup>‡</sup>, Mark. G. Little\*, Ronald Kistler<sup>§</sup>, Ulyana N. Horodyskyj\*<sup>¶</sup>, William P. Leeman<sup>||</sup>, and Arnaud Agranier\*<sup>\*\*\*</sup>



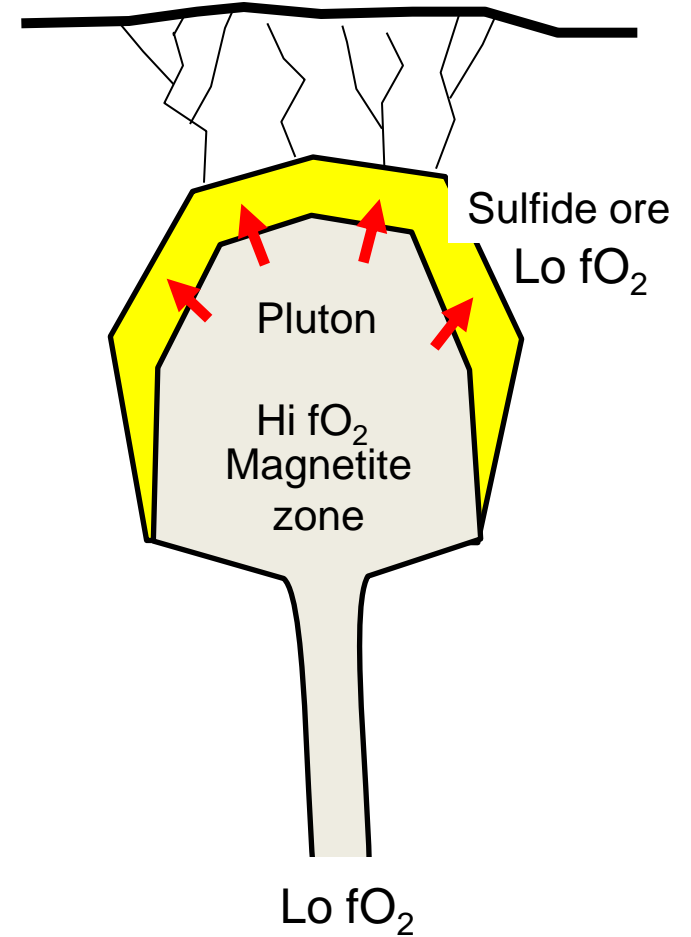
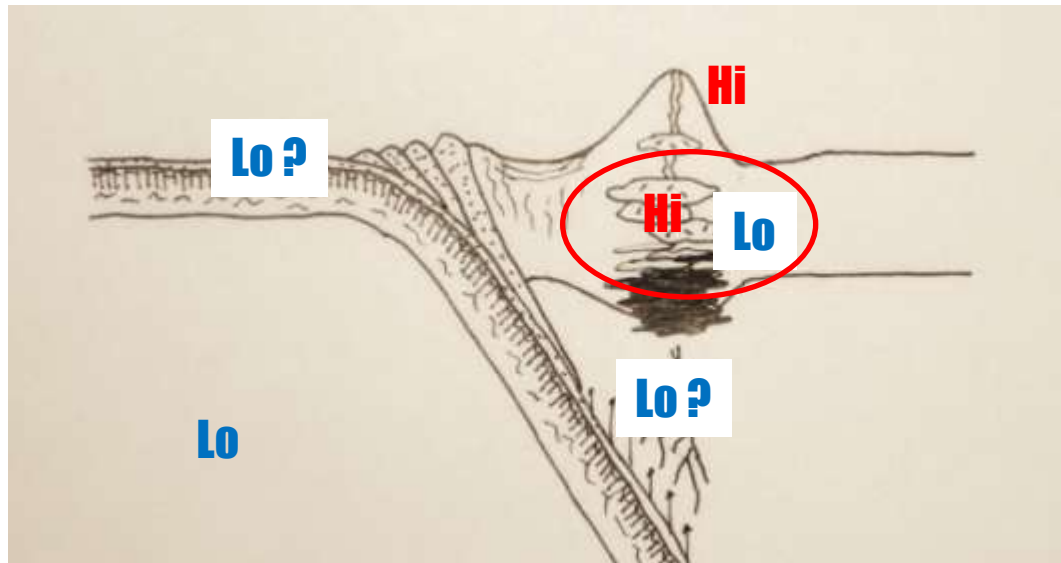
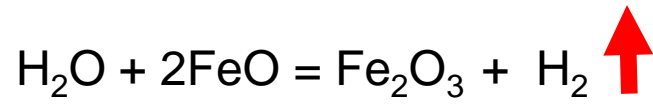
# Zn/Fe<sub>T</sub> as fO<sub>2</sub> index



Lee, Luffi, Le Roux, Dasgupta  
(in preparation)



# Is oxidation of arc lavas a shallow level process?



# Environment

# Geophysics & Seismology

## Hydrology

## Sedimentology

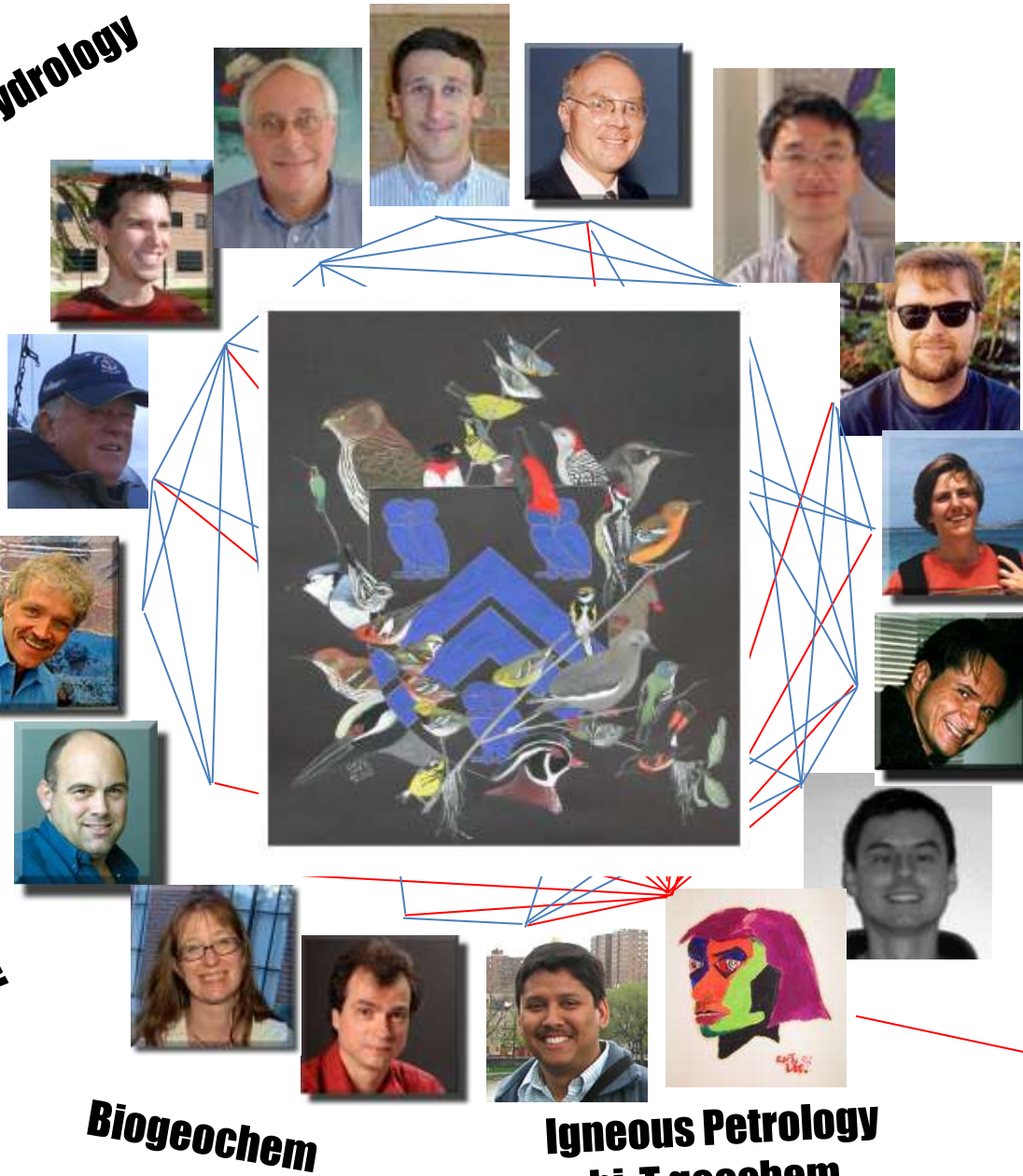
## Structure and Tectonics

## Paleo-oceanography

## Geodynamics

## Biogeochem

## Igneous Petrology hi T geochem

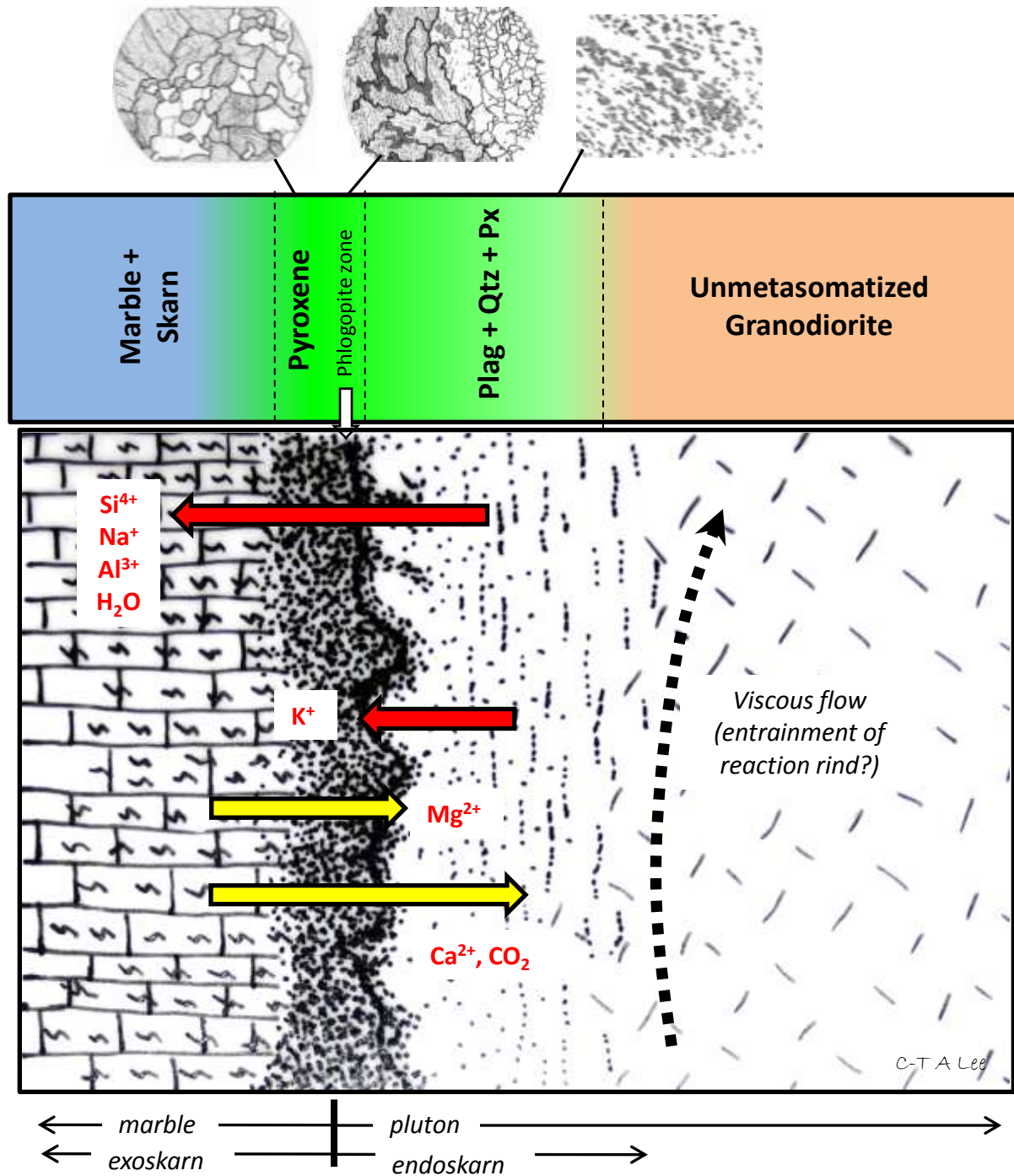


# The future?



Zheng Jianping

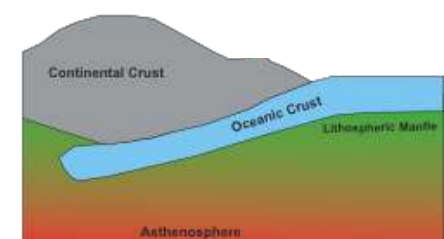
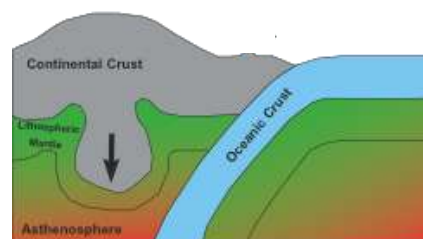
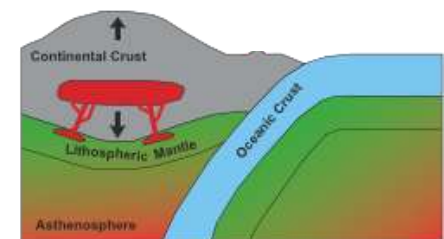
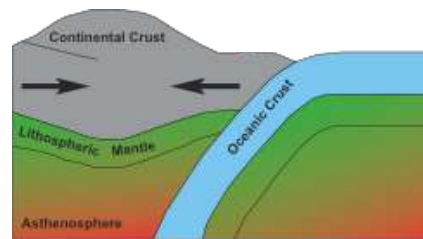
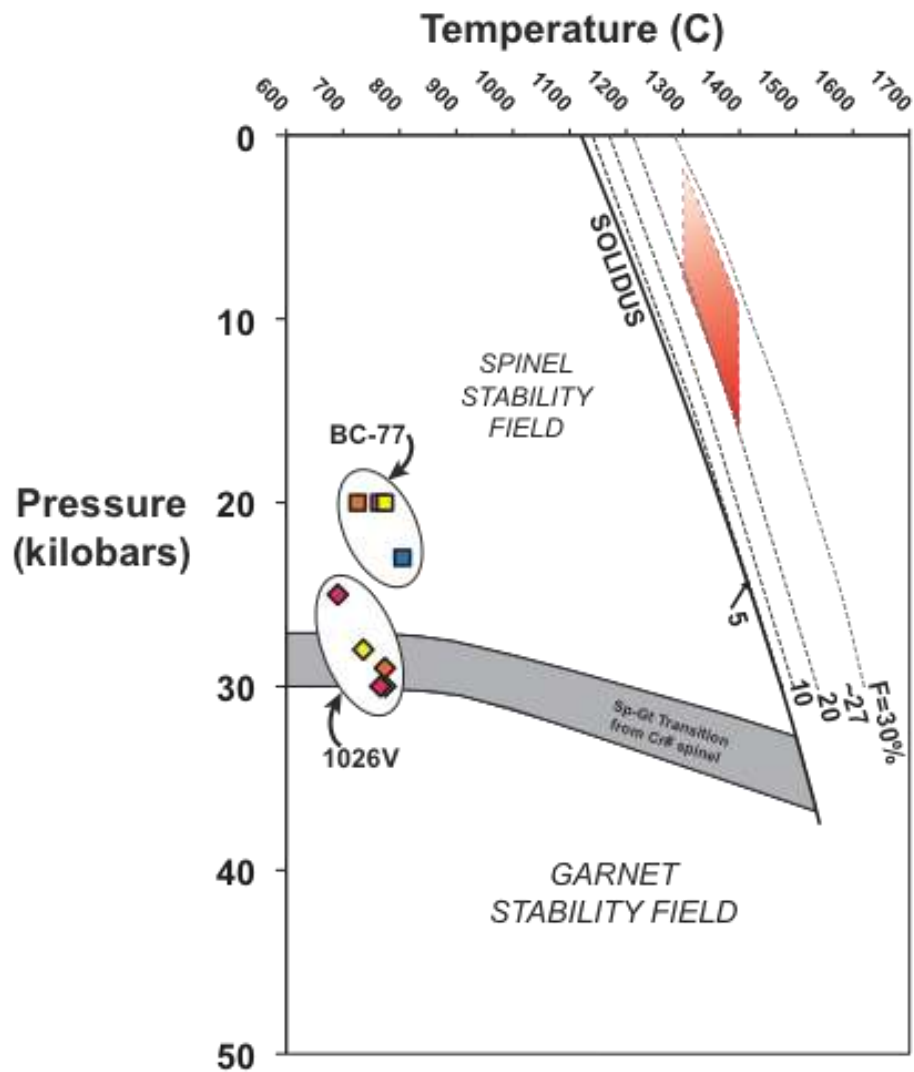
# Endoskarn formation -Dyer et al.





# P-T evolution of deep arc lithosphere

-Emily Chin, Peter Luffi, Cin-Ty Lee



李子忻地是大笨蛋

