EOSC 450
Potential Fields in Earth and Planetary Science
A few essentials…..

Instructor: Manar Al Asad

               malasad@eoas.ubc.ca, EOS Main 302

Class: Tues, Thurs: 2:00 – 3:30pm EOS-Main 105

Office hours: just ask, right after class is best.

Text: See web site. Click on the dot.

               Also: useful references list on syllabus

TA: Megan Russell
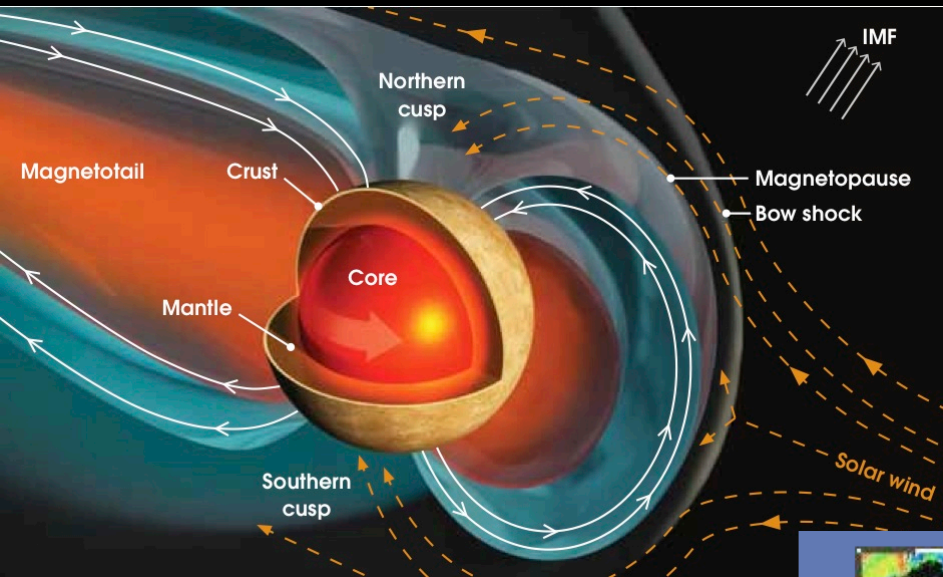
               mrussell@eoas.ubc.ca, EOS-Main 302

Website:

   www.eoas.ubc.ca/academics/courses/eosc450/index.html

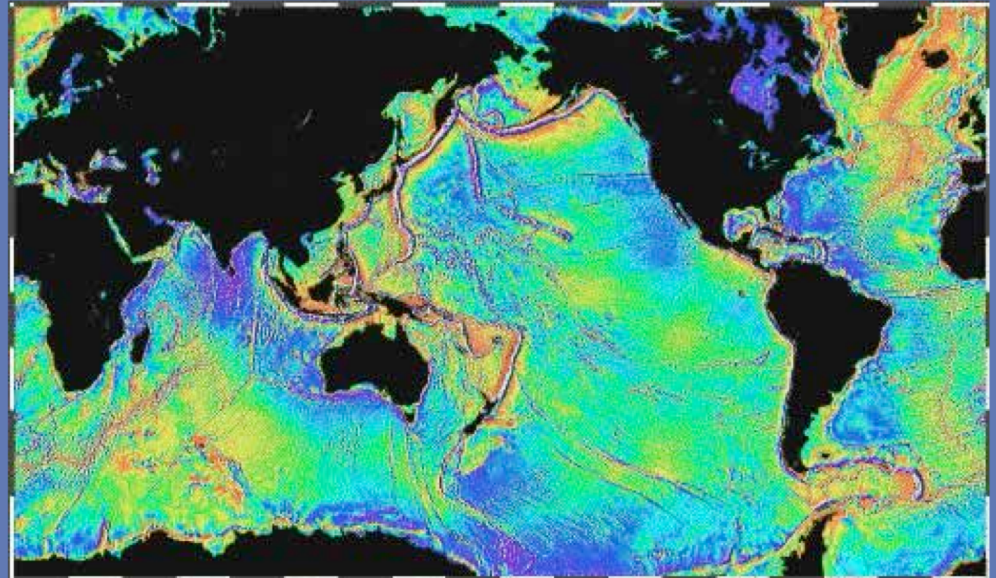All class notes / problem sets etc. posted here

We will NOT use canvas

Some Topics

IMF

Northern cusp

Magnetotail   Crust

Core

Mantle

Magnetopause
Bow shock

Southern cusp

Solar wind

Sandwell & Smith, 1997

Magnetic fields

Marine gravity

EOSC 450
Potential Fields in Earth and Planetary Science
A few essentials…..

See course outline and schedule for details (coming soon on the website…).

- We may modify the schedule, esp. in the second half of term. These will be announced in class and via email.

Assessment

- Assigned problems (6-7 problem sets)   35%
- Quizzes (4-5 quizzes)   35%
- Capstone Assignments (1)   20%
- Class participation   10%

You can each bring 1 page (1 side of notes on 1 letter-sized page) of review notes to each quiz.   There is no midterm or final.

Notes on Class Participation (see course outline)
Bottom line: come prepared ☺

- Participation grade will be based on your participation in class, on how well prepared you are for each class, and whether your own participation facilitates participation by others.

- Some of the material is heavily mathematical. I will ask you to read the material *before class* and to come to class sufficiently well prepared to attempt to teach some of the material to your peers and/or to clearly elucidate anything that was difficult or confusing about the material. Sometimes I will ask you to turn in summary notes on the reading, prepared in advance of class.

- A working knowledge of MATLAB to the level covered in EOSC 211 is assumed. We will use MATLAB in the problem sets.

What is due soon?

Week 2: Tues Sept 11 (i.e., next class)
- Read the introductory material and remind yourself of everything in it – it should all be review.

Week 2: Thurs Sept 12
- Read the math background
- Turn in Problem Set 1: Math review – due in class

# Some very basic advise to be successful with the Problem Sets:

1. Clear and clean presentation; **leave spaces for comments**

2. Clear figures that include title, axis label, and legends

3. Matlab script well structured, written, and commented

4. All questions/subquestions answered **OR difficulties met with unanswered questions were explained**

5. What you write seems to be really understood, without major mistakes (e.g. dividing a scalar by a vector is a major mistake) and you do not jump any important step in calculations

Some very basic advise to be successful with the Problem Sets:

- At the beginning of a problem, the physical frame, theory, and hypothesis used are clearly stated

- Good use of "hints" or "pointers" posed in the question, the result of previous questions, and tricks or hypothesis before starting endless calculations or reasoning

- When necessary, text and calculations are accompanied by a simple scheme/summary in order to make understanding easier

- Verifications are used to check the reasonableness of results (sign, dimension, order of magnitude, physical meaning, etc...)

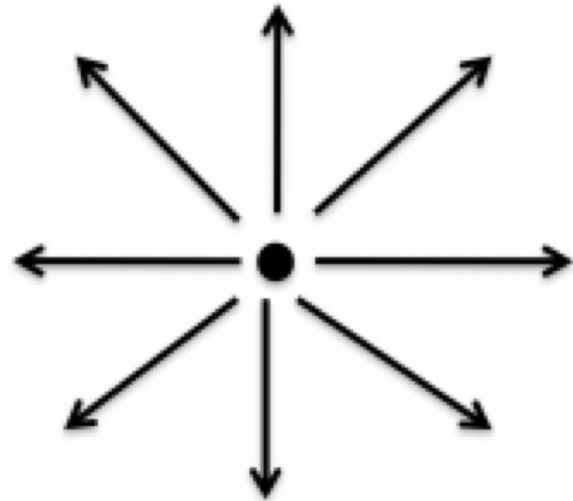- Physical or numerical meaning of results are discussed

Some warm-up questions before you read the intro material…

- What is a field?
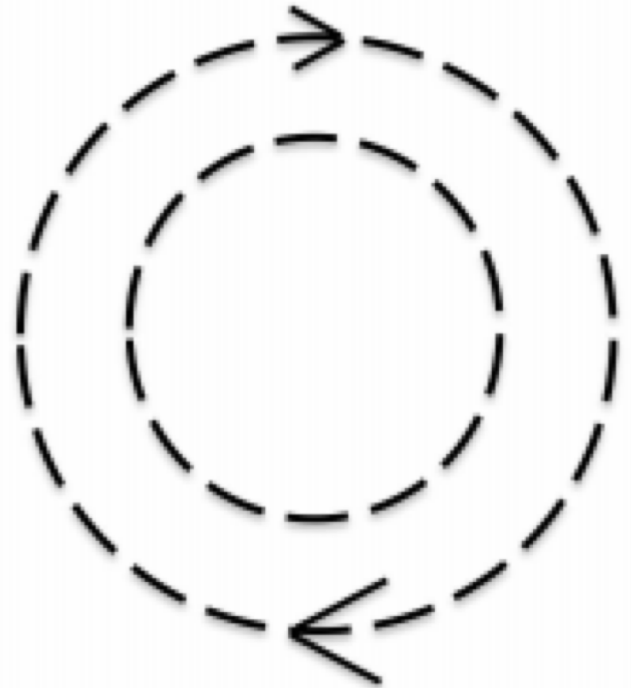- What is a scalar field?
- What is a vector field?
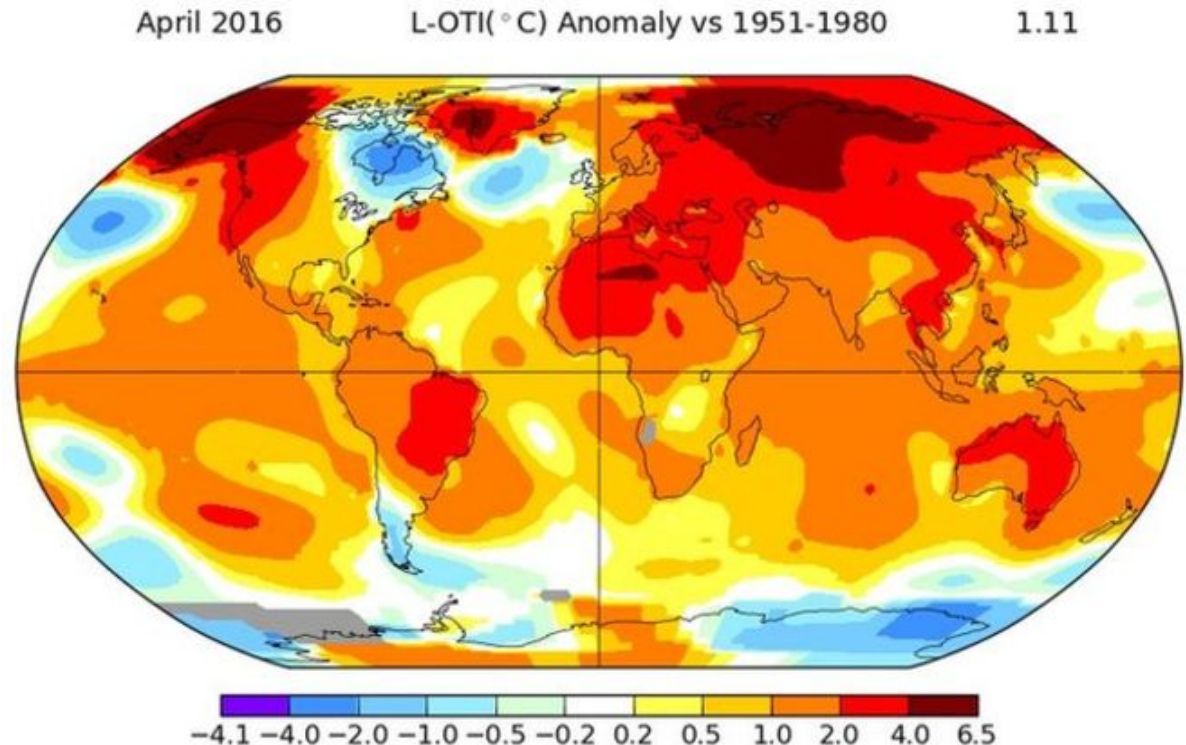
April 2016 temperature anomaly (NASA)

- What is the divergence?
- Does it apply to a scalar or vector field?
- Does it produce a scalar or vector field?
- How is it related to the nabla operator?

- What is the curl?
- Does it apply to a scalar or vector field?
- Does it produce a scalar or vector field?
- How is it related to the nabla operator?

Once again…what is due soon?

Week 2: Tues Sept 11 (i.e., next class)
- Read the introductory material and remind yourself of everything in it – it should all be review.

Week 2: Thurs Sept 13
- Read the math background
- Turn in Problem Set 1: Math review – due in class