GFD Q&A

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Geophysical Fluid Dynamics (GFD)

Aim: Train PhD fellows in geophysical fluid dynamics through collaborative projects with domain experts

People

- **Fellows:** PhD students (8 weeks)
- **Staff:** Academics who supervise projects (8 weeks)
- **Visitors:** Academics who visit, give seminars, contribute to projects
- **Principal lecturers:** Theme experts who give lectures at start of program

Lectures and Seminars

Week 1 and 2 (Mon): Theme lectures

Oceanic Internal Gravity Waves
Bruce Sutherland and Jennifer Mackinnon

Weeks 3 to 7: Visitor seminars

Week 8 (Thurs + Fri): Fellow presentations

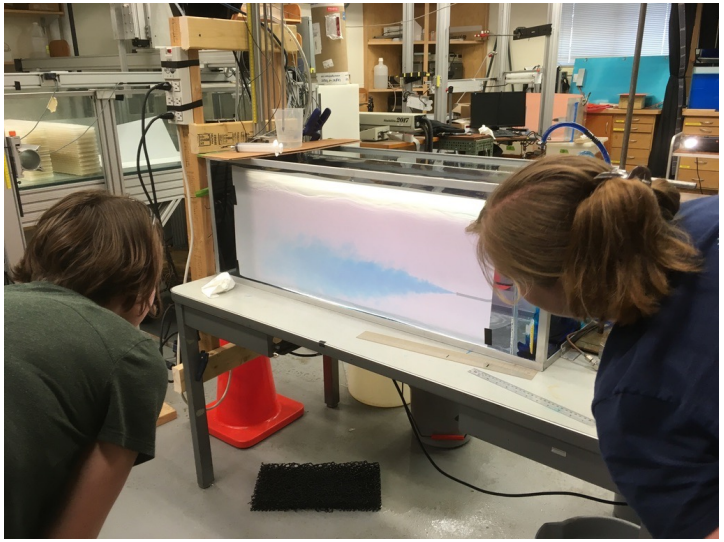
Projects

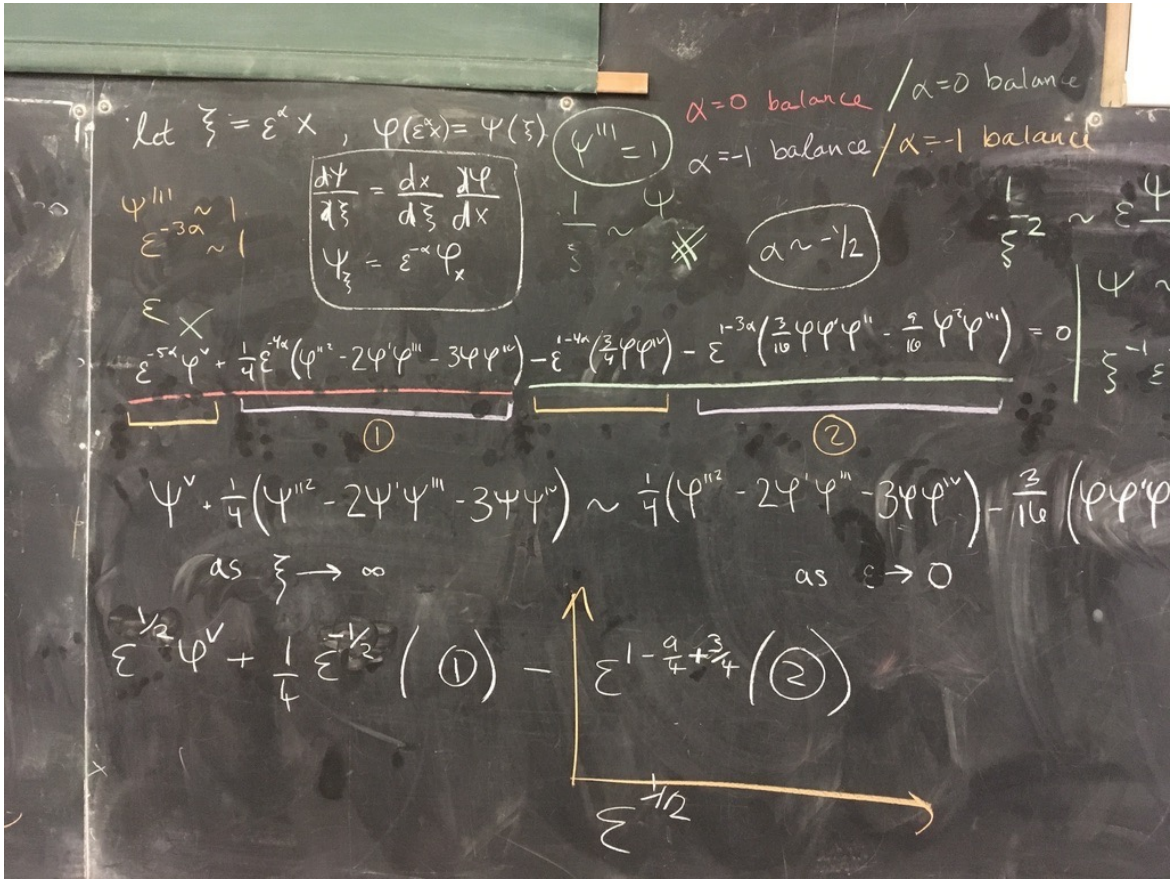
Week 1: Projects proposed by academics. Fellows meet academics to discuss projects.

Weeks 2-7: Fellows choose and carry out projects

Week 8: Fellows prepare and present results on Thurs + Fri

After the program: Fellows wrap up projects, write a chapter for proceedings, some continue to collaborate with academics




let $\xi = \varepsilon^{\alpha} x$, $\varphi(\varepsilon^{\alpha} x) = \psi(\xi)$
$\psi''' = 1$
$\frac{d\psi}{d\xi} = \frac{dx}{d\xi}\frac{d\varphi}{dx}$
$\psi_{\xi} = \varepsilon^{-\alpha}\varphi_x$
$\alpha = 0$ balance / $\alpha = 0$ balance
$\alpha = -1$ balance / $\alpha = -1$ balance
$\psi''' \sim 1$
$\varepsilon^{-3\alpha} \sim 1$
$\alpha \sim -1/2$
$\varepsilon^{-5\alpha}\psi^{v} + \frac{1}{4}\varepsilon^{-4\alpha}(\psi''^2 - 2\psi'\psi''' - 3\psi\psi^{iv}) - \varepsilon^{1-4\alpha}(\frac{3}{4}\psi\psi'\psi'') - \varepsilon^{1-3\alpha}(\frac{3}{16}\psi\psi'\psi'' - \frac{9}{16}\psi^2\psi''') = 0$
①
②
$\psi^{v} + \frac{1}{4}(\psi''^2 - 2\psi'\psi''' - 3\psi\psi^{iv}) \sim \frac{1}{4}(\psi''^2 - 2\psi'\psi''' - 3\psi\psi^{iv}) - \frac{3}{16}(\psi\psi'\psi$
as $\xi \to \infty$
as $\varepsilon \to 0$
$\varepsilon^{1/2}\psi^{v} + \frac{1}{4}\varepsilon^{-1/2}(①) - \varepsilon^{1-\frac{a}{4}+\frac{3}{4}}(②)$
$\varepsilon^{1/2}$

Application

- **A current CV** or resume with educational background and work experience

- **Three written recommendations**

- **A short statement** (1 page or less double-spaced) that outlines your educational background and provides a synopsis, for the non-specialist, of your studies and research to date

- **A short statement** (1 page or less double-spaced) of what you might hope to accomplish in a GFD Fellowship at WHOI

What are we looking for?

- **Academic Achievement and Potential:**
  Refereed publications, conference presentations
  *(depending on PhD stage)

- **Academic Background:**
  Expertise in fluid dynamics/oceanography/other areas of GFD
  *(not just the theme)

- **Interest:**
  Motivation to become a GFD fellow

Common application missteps

- Proposing to work on just your PhD project while at GFD
- Saying you want to work with a specific person
- Saying you want to work on a specific project

Deadline for applications 5th Feb