MATH5453M Foundations of Fluid Dynamics

Homework 3

Please leave in my pigeonhole (located to the right of the door to my office—School of Mathematics 11.07) by Monday 5 January 2026 at 4pm

Attention: Initial deadline on Friday 5 December 2025

Please download the file located at

https://www.cbeaume.com/download/MATH5453_homework4.tar

by copying the above address and pasting it into your browser URL field, then untar it. You will find that it contains 7 folders entitled:

1. Control,
2. Edge,
3. Models,
4. Threshold,
5. Taylor–Couette,
6. Porous Medium Convection,
7. Doubly Diffusive Convection.

Each of these folders relates to one topic named in its title and contains two research articles.

Please email me (c.m.l.beaume@leeds.ac.uk) by Friday 5 December 2025 to give me three topic choices in order of preference, from your favourite to your 3$^{\text{rd}}$ favourite. I will endeavour to answer, confirming your topic within 24h of receipt.

You will write a review on the confirmed topic. Your review should be targeted to a readership with a general understanding of undergraduate level fluid dynamics but no prior knowledge of the specific problem about which you are writing. You may choose to focus on one of the two papers, on both of them, or on any other related paper of your choice. You will explain the research context (which might require reading beyond the suggested articles) and the problem that these papers address. You will also describe the results contained in these papers as well as explain why you think they are important. It is important that you should do more than just paraphrasing papers. Your essay should not exceed 4 pages using normal formatting and might include one or two figures if they help your explanation (it is also an exercise in succinctness).

Assessment criteria include the displayed understanding of the literature and the appropriateness of the report for a readership of undergraduates.