# Notes on meetings ASC 2021

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August 2021

## What is this?

Quick notes on what I remember from each meeting.

## 10th of September 2021

### General Notes

1. $p = p_{hydrostatic}$ will not work. It does not account for dynamic pressure terms. We need a more complex method.
2. Read some engineering texts on how they typically deal with these pressure terms
3. Look at the stream function approach in 2D. Should be pretty simple to code this up. Look at the affect of the inner boundry on results of the code.
4. Read the two papers on the lattice-boltzman method. Might look at solving the full 3D problem like this

### Main goals for this week

1. A broad understanding of how other people solve these problems
2. A simple 2D simulation
3. An approximate path for solving this problem

## 23rd of september 2021

### General Notes

1. We discussed convection in a box
2. Code I have now looks approximately correct

3. Should look at adding ghost points. These ghost points will allow for a method of images style of temperature boundry condtion. It should also allow for faster processing allowing for simple vector operations.
4. More testing of this simple code should be done
5. Go test if diffusion is working
6. Use the "cone test" to see if advection is working. Take a parcel of fluid and transport it around, see if it deforms by taking it around a circle.
7. I need to think a bit more about the above two
8. Next we looked at modelling this on a disk
9. Its probably not the case that the streamfunction method doesnt give an eligant solution in polar coordinates so keep trying
10. Talking about not being able to access a lot of LBM papers

# 1st of October 2021

## General Notes

1. Clean up the plots so you can actually read them and use a polar projection for the disk code
2. Add velocity arrows and contours to the plots
3. Look closely at the boundries, make sure that I have used the correct boundary conditions
4. My scheme is not stable. This is because of the advection term in the the temperature equation.
5. Look in Numerical Recepies/in the notes for some solutions to this
6. Semi-lagrange Crank-Nickleson scheme is a scheme that I could try, its unconditionally stable and accurate
7. REALLY IMPORTANT: I need to find a scheme that is stable and accurate, without it the base programs will not work
8. Once I get the a stable scheme I should work on LBM code (if I have time)
9. I should also do the checks that my code is working from last week that I didnt do