

# Pre-class assignment #11

PHY-905-005  
Computational Astrophysics and Astrostatistics  
Spring 2023

**This assignment is due the evening of Wednesday March 1, 2023.** Turn in all materials via GitHub.

**Reading:**

1. Chapter 7.1-7.5 of of *An Introduction to Computational Physics*, by T. Pang (PDF; provided)
2. (optional) Sections 9.1 and 9.2 of *Computational Physics*, by Newman.

**Your assignment:**

1. After reading the assigned sections of Pang, list at least two questions that you have about solving elliptical equations in the file `ANSWERS.md`.
2. Solve the problem in Section 7.4 of Pang – the distortion of a bench due to a person sitting on it, as described in Equations 7.64 and 7.67 – using the matrix method. Note that you don't need to write your own linear algebra solver – use the solver available in the SciPy `linalg` package. Think carefully about the boundary condition that you use here, and how it is represented in the matrix! In the file `ANSWERS.md`, comment on how you might treat other boundary conditions differently.

**Handing it in:** Include your code, your plots, and your answers to the questions about (in the file `ANSWERS.md`) in your assignment.