ASTR 598 - Statement of Work

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Topic

The topic of this course is Coronal Seismology. This is rather broad, which should help to put my previous research into context, as well as reveal other possible thesis topics. The main areas of coronal seismology to be addressed throughout the semester are:

1. Kink oscillations
2. Sausage oscillations
3. Acoustic oscillations
4. Propagating acoustic waves
5. Propagating fast waves
6. Torsional modes
7. Mixed modes

Coursework

The four points of emphasis as laid out by the syllabus for ASTR 598, along with the portion of allotted time to be spent on them are addressed as follows:

1. **30% Literature review capabilities:** Each week I will choose two papers to read and discuss the following week. One will be either a reference from a review article, a general overview of the topic, or something covering the first observations of the phenomenon. The other will be something fairly recent to see how knowledge of the topic has developed and how it is being studied now.
2. **30% Scientific writing skills:** I will complete a writeup, `aastex` style, describing the background information from the literature, general relevance to science/astronomy, possible projects, and my current research. Each paper will be summarized in $\sim 1/3$ of a page.
3. **30% Scientific presentation skills:** The results of this course will be presented at a pizza lunch talk on April 25th at 12:30 pm.
4. **10% Experience with one or more research investigation tools:** As most of the work I have done so far has involved data analysis, this part will comprise the smallest portion of the total workload. A short description of my research will be provided, along with how it ties in with the main topic.

Grading

The grading scheme for this course will be based on the fraction of time dedicated to each of the four tasks listed above (i.e., each portion contributes the specified percentage to my grade). 100% completion will be an A, 80% will be a B, and 60% will be a C.

Milestones

We will meet every Thursday at 11am to discuss the assigned reading for that week, ensure that I am still on track, and make any necessary changes or additions to the statement of work. Outside of this meeting, I plan on spending at least eight hours a week addressing the points listed above. At the time of writing (2/4/2016) my plan is to read the two chosen papers every week, and add to both the writeup and the presentation. A detailed schedule is included on the next page (to be revised and adjusted as needed throughout the semester).

Schedule

1/28

- Discuss syllabus
- Set up a github account for a598
- Set up aastex for writeup
- Write a Statement of Work
- Select another review article

2/04

- Add a complete schedule to the statement of work
- Read section 2 in Nakariakov
- Read Ch. 6 on MHD in Aschwanden
- Start formulating a list of topics for the semester

2/11

- Read Ch. 7 on MHD Oscillations in Ashwanden
- Read section 2 in Nakariakov
- Read CORONAL LOOP OSCILLATIONS OBSERVED WITH THE *TRANSITION REGION AND CORONAL EXPLORER*
  -Aschwanden et al.
- Read Excitation and damping of broadband kink waves in the solar corona
  -D. J. Pascoe et al.
- Summarize papers in writeup
- Create presentation slide for papers
- Add a description of research to writeup

2/18

- Read Sausage Waves in Transversely Nonuniform Monolithic Coronal Tubes
  -Lopin and Nagorny
- Read Observations of Sausage Modes in Magnetic Pores
  -Morton et al.
- Summarize papers in writeup
- Create presentation slide for papers

2/25

- Read Observations from *Hinode*/EIS of intensity oscillations above a bright point: signature of the leakage of acoustic oscillations in the inner corona
  -A. K. Srivastava and B. N. Dwivedi
- Read On Coronal Oscillations
  -Roberts, B.; Edwin, P. M.; Benz, A. O.
- Summarize papers in writeup
- Create presentation slide for papers

3/03

- http://search.proquest.com/docview/1548708487
- Read Slow magnetoacoustic waves in coronal loops: EIT and TRACE
  -Robbrecht et al.
- Read Measuring Temperature-dependent Propagating Disturbances in Coronal Fan Loops Using Multiple SDO/AIA Channels and the Surfing Transform Technique
  -Uritsky et al.
- Summarize papers in writeup
- Create presentation slide for papers

3/10

- Read Distinct propagating fast wave trains associated with flaring energy releases
  -Yuan, D. et al.
- Read First Simultaneous Observation of an Hα Moreton Wave, EUV Wave, and Filament/Prominence Oscillations
  -Asai, et al.
- Summarize papers in writeup
- Create presentation slide for papers

3/17

- Spring Break

3/24

- Read Coronal Alfvén Speed Determination: Consistency between Seismology Using AIA/SDO Transverse Loop Oscillations and Magnetic Extrapolation
  -Verwichte, E.; Van Doorsselaere, T.; Foullon, C.; White, R. S.
- Read Persistent Doppler Shift Oscillations Observed with Hinode/EIS in the Solar Corona: Spectroscopic Signatures of Alfvénic Waves and Recurring Upflows
  - Hui et al.
- Summarize papers in writeup
- Create presentation slide for papers

3/31

- Work on presentation: general MHD, modes, motivation, etc.
- Continue editing writeup

4/07

- Add research to writeup and complete it
- Add research to presentation and complete it

4/14

- Discuess Revisions for paper and presentation
- Revise writeup
- Revise presentation
- Practice presentation

4/21

- Prepare for presentation on Monday