

**ASTRONOMY 9604A:
Galactic and extragalactic infrared astronomy
2009–2010: Fall term**

General Information

- **Class meeting times:**
Wednesday 10.30-12.30am, PAB 232
Friday 9.30-10.30am, PAB 232
- **Instructors:**
Prof. Pauline Barmby; Rm 318 PAB; phone : 661-2111 ext. 81557; e-mail: pbarmby-at-uwo.ca
Prof. Els Peeters; Rm 213 PAB; phone: 661-2111 ext. 80973; e-mail: epeeters-at-uwo.ca
- **Course Website:**
accessible through WebCT: <http://owl.uwo.ca>
- **Office Hours:**
Prof. Barmby: Thursday 3–4.30pm or by appointment
Prof. Peeters: Tuesday 2.00–3.00pm, or by appointment.
- **Textbook:**
No required textbook.

Course Description

- **Calendar description:** Techniques and methods of infrared astronomy, including imaging, spectroscopy and interferometry with ground- and space-based instrumentation. Application to research in star formation, the interstellar medium, nearby galaxies, and the high-redshift universe. 3 lecture hours/week. Half course; one term.
- **Course objectives:** The goal of the course is to equip you to understand and analyse observational infrared data. We will focus not on detailed physics, but on observational techniques and phenomenology. By the end of this course you should be able to read and understand a paper which makes use of infrared data, even if it is not in your area of research.
- **Class meetings:** Class meetings will involve lecturing and discussion of the week's assigned reading (typically a textbook chapter and/or review paper): *students must come to class prepared to discuss at least two issues or questions from the reading*. These discussions will form part of your participation mark.
- **Description of assignments:** There will be four assignments, to be distributed via WebCT. All are due on Mondays. In addition, there is a larger project, described in detail below.
- **Description of examinations:** There will be a final exam during the final exam period on a date to be chosen by consultation with class members.
- **Project :** Write an observing proposal for a topic of your choice which uses an IR instrument of the list provided by the instructors. Formatting instructions for the relevant observatory and limits on number of pages, figures, etc should be obeyed. The 'technical plan' part of the proposal is required, but the detailed observation specification is not.

There will be several steps to this project. A few weeks into the term, you should have a general idea of what you are interested in observing. By October 2, 2009 an abstract of your proposal

needs to be submitted. The final written version of the proposal is due by November 4, 2009. All students will present their proposal in a class session on November 11, 2009. The proposal needs to be entirely your own work: *proposals written for your MSc or PhD research in collaboration with other researchers will not be accepted.*

Marks will be based on:

- scientific justification: explanation of the problem and importance
- technical quality: feasibility, efficiency of proposed observations
- compliance with proposal requirements
- quality of oral presentation
- participation in presentation discussion
- originality of proposal concept

Possible observatories/instruments:

- Gemini: <http://www.gemini.edu/>
- CFHT: <http://www.cfht.hawaii.edu/WIRCAM>
- Spitzer: <http://ssc.spitzer.caltech.edu>
- Herschel: <http://herschel.esac.esa.int/>
- SOFIA: <http://www.sofia.usra.edu/Science/index.html>

A good place to start working on ideas is to browse the abstracts of accepted proposals for these facilities, which you can do at the websites listed above. Your instructors are happy to discuss ideas with you.

Mark distribution :

Assignments	30%
Project 1: Abstract	5%
Project 1: Proposal	25%
Class participation	10%
Final exam	30%

Course Calendar/Schedule (subject to change)

Week of	Topic (approx.)	Notes
Sep. 7	Introduction	First class Fri Sep 11
Sep.14	Telescopes & observing proposals (PB)	Sep 18: Last day to add this course
Sep.21	IR detectors & Photometry (PB)	Sep 25: lucky Friday
Sep.28	Spectroscopy (EP)	Assign. 1 due Sep 28 Abstract due Oct 2
Oct. 5	Applications of photometry (PB)	Oct 9: lucky Friday
Oct.12	Surveys, archives and databases (PB)	Assign. 2 due Oct 12
Oct.19	Dust (PB)	Oct 23: lucky Friday
Oct.26	Catch-up (PB)	Oct 30: lucky Friday
Nov. 2	Atomic IR lines (EP)	proposal due Nov 4 Nov 6: lucky Friday
Nov. 9	Proposal presentations	
Nov.16	Atomic & molecular lines (EP)	Nov 20: lucky Friday
Nov.23	Molecular IR lines (EP)	Assign. 3 due Nov 23
Nov.30	PAHs and ices (EP)	Dec 4: lucky Friday
Dec. 7	Catch-up (EP)	Assign. 4 due Dec 7
early Dec	Final exam (date TBD)	

Lucky Fridays are intended to let you work on your assignments and your proposal.

Course policies

- Attendance at class meetings is required (and is important for your participation mark).
- Advance permission must be received for a delayed due date for assignments or projects, and we reserve the right to refuse permission and/or penalize late submissions.
- Missed proposal presentation: all students must present their projects on a date to be announced. Documentation must be provided to the instructors to get permission to present on a different date, and marks may be adjusted to reflect extra preparation time.
- Missed final exam. Documentation needs to be provided in order to write a make-up exam.
- Religious holidays: we will attempt to schedule presentations and class activities to avoid religious holidays; please inform the instructors if you foresee problems with the current schedule. See the University's Academic Handbook for the full policy.
- Academic misconduct:

Plagiarism: Students must write their essays and assignments in their own words. Whenever students take an idea or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing (such as footnotes or citations). Plagiarism is a major academic offense. For more details, see <http://www.uwo.ca/univsec/handbook/appeals/scholoff.pdf>.

All required papers may be subject to submission to textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).