Welcome to the UMaine Introduction to Astronomy Laboratory. In this class, we will explore some models of our world, solar system, and universe through both actual outdoor observing and software. This course requires the student to be taking, or have already taken, AST 109, the Introduction to Astronomy Lecture (either the live or online section is sufficient). It is assumed throughout this course that the student knows the material that is covered in AST 109. As such, in many of the lessons, the instructions, and material in ASTO 110 are not designed to teach you the material, but to get you to apply material that you already know.

Ensure that you have access to the online course material for AST 110, posted on Blackboard. Blackboard is an electronic service for hosting courses and storing course information online. You must activate your Blackboard account to participate in this course. Contact IT for help with your Blackboard account (click here or call (207) 581-2506). For any technical problem with the course, please email CED Technical Support at cedtechhelp@umit.maine.edu or call toll-free at 1-877-947-HELP.

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1 Communication

Once you can access the ASTO 110 course content, on Blackboard, complete the first assignment: Locate the email addresses for both course instructors, on our course home page on Blackboard, and email both course instructors with your preferred email address.

- One course instructor is the lead instructor, to whom you should direct questions about the course.
- The other course instructor is the course grader, to whom you may direct grade-related inquiries.
- If there are any changes throughout the semester of whom you should contact for any particular questions, it will be posted on the course announcements.

Your preferred email address is an email address that you frequently access and is convenient for you. You may use your @maine.edu email, your FirstClass email, or another email. We will use your @maine.edu email by default until you specify a preferred email address. On Monday, August 31 and Monday, September 7, you will receive emails with pertinent course information. The instructors may also post announcements on Blackboard.

2 Essential Course Materials and Requirements

Access to a modern Mac or PC (required). Click to see the official platform requirements.

Stellarium (required). Stellarium simulates the night sky on your computer. You must download and install this free software from the publisher’s website. More information is available on Blackboard.


Discovering the Essential Universe by Comins & Kaufmann, 6th ed. (optional). We strongly recommend this text, as it is used for the AST 109 lecture course.

Note: The “AST 110 Lab Manual,” a shiny black booklet located in the University of Maine Bookstore, is NOT appropriate and will NOT be used for this online course. The lab manual booklet is reserved exclusively for students taking the LIVE version of this course (on the University of Maine campus). As a courtesy to the students in the live lab, if you have a copy of the booklet, you should return it ASAP.
3 Observation Projects - 30% of course grade

An essential component of astronomy is identifying and locating stars and sky objects. You may receive an “incomplete” for the course if you have excused absences (see below for details on unexcused absences). Each project is worth 15% of your course grade:

- **Constellations Project**: Locate 10 constellations and their stars in the sky to an instructor.
- **Sky Objects Project**: Document visual details of 8 sky objects located by an instructor.

*Up to 5 more constellations and 2 more sky objects may be observed for extra credit.*

You must print and bring the **observation packet** (on Blackboard) with you to every observation session. All work done on both projects requires exclusively these sheets. Your work must be signed and dated by a qualified instructor during the session for credit. Mail your completed observation packet (and retain a copy for backup) by **Friday, December 11 at 4:00 p.m.** to:

University of Maine

[– Write “c/o” – then write the full name of the course grader –]

120 Bennett Hall
Orono, ME 04469-5709

3.1 If you live WITHIN one hour of Orono, Maine

**Nighttime Commitment:** You must commit to one weeknight between Monday and Thursday in which you will come to the Maynard F. Jordan Observatory on the University of Maine campus each week from 8:00-10:00 p.m.. All work done on both projects requires the **observation packet** (online) as well as an instructor’s signature. **Attending weeknights to which you are not committed, without specific permission for attending another night, will result in your work being voided for that night. Projects are due by Friday, December 11 at 4:00 p.m.** (For printing the observatory packet on campus, use the Memorial Union cluster printers.)

The Maynard F. Jordan Observatory will open (on clear nights) beginning on the night of **Tuesday, September 8** and ending no later than the night of **Thursday, December 10**. However, we will close on a particular weeknight after four observing sessions on that night (exceptions will be announced online).

**Attendance:** To see if the observatory will be open on a night:

- Call **(207) 581-1348** shortly after 7:00 p.m., wait a few rings, then press 1 to hear that night’s message.
- Alternatively check for the night’s announcement on [http://twitter.com/umaineastrolab](http://twitter.com/umaineastrolab) or [http://www.facebook.com/UMaineAstronomy](http://www.facebook.com/UMaineAstronomy), which are posted by after 7:00 p.m..

Approximately four constellations and three sky objects are shown per session. **You are responsible for attending all open sessions on your one weeknight until you have completed both projects.** If poor weather prevents you from completing your projects, then you will be held responsible for only the objects that were shown on your one weeknight. The observatory will be closed on official dates with no classes, such as MLK day and fall/spring breaks.

**Absences:** Unexcused absences will result in reduced maximum scores on both observation projects (90%, 70%, 40%, 0% respectively after 1, 2, 3, 4 unexcused absences). Email both the course instructors if you must be excused due to official campus events, illness, or documentable emergencies.
Be sure to attach your documentation to your observation packet at the end of the semester. You will receive the above penalties on the projects if your absences are not excused.

### 3.2 If you live FARTHER than one hour from Orono (but still in Maine)

You must complete both projects with one of our qualified local observing experts (LOEs), local to you that is. Send a polite email to an LOE (and a copy to both course instructors) requesting to complete your observational projects with this individual. Keep in mind that LOEs are volunteers, so if you still get no response after sending a few polite emails over a week or so, then move on, and contact another LOE. If you have failed to contact any LOE (that you then also forward to the course instructors) **by the end of the third week** of the course, then you automatically lose half credit for both of your observation projects. It is thus very necessary to email and follow up with a LOE, if you get no response initially. It is your responsibility to re-schedule if a session is canceled (e.g. due to weather). Directions for pointing out constellations are posted on Blackboard. Come prepared to impress your LOE! As a first exercise in locating constellations, show your LOE how you can use clock directions and degrees to locate *Dubhe*, a star in the “Big Dipper,” and then Polaris.

#### Local Observing Expert (LOE) Contact Information and Locations

<table>
<thead>
<tr>
<th>Expert</th>
<th>E-mail</th>
<th>Location (click for map)</th>
</tr>
</thead>
<tbody>
<tr>
<td>David Sylvester</td>
<td><a href="mailto:plantation@207me.com">plantation@207me.com</a></td>
<td>Barnard Township, ME</td>
</tr>
<tr>
<td>Robert Burgess</td>
<td><a href="mailto:rburgess250@comcast.net">rburgess250@comcast.net</a></td>
<td>Brunswick, ME</td>
</tr>
<tr>
<td>Peter Kalajian</td>
<td><a href="mailto:alnitak@gwi.net">alnitak@gwi.net</a></td>
<td>Camden, ME</td>
</tr>
<tr>
<td>Larry Berz</td>
<td><a href="mailto:berzl@mssm.org">berzl@mssm.org</a></td>
<td>Caribou, ME</td>
</tr>
<tr>
<td>Bernie Reim</td>
<td><a href="mailto:bernard.reim@maine.edu">bernard.reim@maine.edu</a></td>
<td>Kennebunk, ME</td>
</tr>
<tr>
<td>Roberta L. Trefts</td>
<td><a href="mailto:TrefTsRo@fc.husson.edu">TrefTsRo@fc.husson.edu</a></td>
<td>Lagrange, ME</td>
</tr>
<tr>
<td>Jeannie Tabor</td>
<td><a href="mailto:startsar2000@yahoo.com">startsar2000@yahoo.com</a></td>
<td>Monson, ME</td>
</tr>
<tr>
<td>Marc Fisher</td>
<td><a href="mailto:mfisher@tdstelme.net">mfisher@tdstelme.net</a></td>
<td>Norridgewock, ME</td>
</tr>
<tr>
<td>Sandra Thomas-Feely</td>
<td><a href="mailto:stars2rockets@gmail.com">stars2rockets@gmail.com</a></td>
<td>Norway, ME</td>
</tr>
<tr>
<td>Joan Chamberlain</td>
<td><a href="mailto:starladyjoan@yahoo.com">starladyjoan@yahoo.com</a></td>
<td>Parsonsfield, ME</td>
</tr>
<tr>
<td>Charles Sawyer</td>
<td><a href="mailto:csawyer7@roadrunner.com">csawyer7@roadrunner.com</a></td>
<td>Pembroke, ME</td>
</tr>
<tr>
<td>Richard Crocker</td>
<td><a href="mailto:thecrock46@cs.com">thecrock46@cs.com</a></td>
<td>Portland, ME</td>
</tr>
<tr>
<td>Gerry Adams</td>
<td><a href="mailto:gerry_adams.46@yahoo.com">gerry_adams.46@yahoo.com</a></td>
<td>Rangeley, ME</td>
</tr>
<tr>
<td>Peter Serrada</td>
<td><a href="mailto:mogeyman@tdstelme.net">mogeyman@tdstelme.net</a></td>
<td>Rome, ME (summer/fall terms)</td>
</tr>
<tr>
<td>Tom Hoffelder</td>
<td><a href="mailto:rocksnstars@gmail.com">rocksnstars@gmail.com</a></td>
<td>South Paris, ME</td>
</tr>
<tr>
<td>David Clark</td>
<td><a href="mailto:declark@maine.edu">declark@maine.edu</a></td>
<td>Stockton Springs, ME</td>
</tr>
<tr>
<td>Dwight Lanphers</td>
<td><a href="mailto:groupastro@lanpherassociates.com">groupastro@lanpherassociates.com</a></td>
<td>Northeast Harbor, ME</td>
</tr>
<tr>
<td>Colin Cassie</td>
<td><a href="mailto:cscmachinedesign@hotmail.com">cscmachinedesign@hotmail.com</a></td>
<td>Whitefield, ME</td>
</tr>
<tr>
<td>Kirk Lurvey</td>
<td><a href="mailto:kthurvey@mdirss.org">kthurvey@mdirss.org</a></td>
<td>Mt. Desert Island, ME</td>
</tr>
</tbody>
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### 3.3 If there is no local observing expert close to you

We have assisted students living in other states (e.g. Florida), and even in Ireland. In the past, students have found local astronomy clubs (such as those known by PBS) local science teachers, local
amateur astronomers, or neighbors with telescopes who know the sky well to work with them. UMaine pays the expert a small stipend for their time with you. Contact David Batuski with who you have found to work with you.

4 Laboratory Lessons - 65% of course grade

The best way to understand the course is to begin it! The lessons are designed to educate you on the astronomical content of the course, as well as give you practice with using Stellarium. Consult the lesson schedule, on our Blackboard home page. While you receive multiple attempts for most lessons, you will generally only receive feedback on the multiple choice questions each time you submit an attempt, as these are graded automatically. Responses to short-answer or essay questions will generally only be graded after the assignment is due, as these must be graded by hand. The only exception to this is in lesson 3 part 1, where there is a separate due date for the first attempt so that you may be given feedback in time to complete your remaining attempts. Your grade for each lesson becomes available after its due date, once all long-answer parts have been graded.

The lessons are listed below:

0. Introduction to ASTO 110 (mostly a review of this syllabus)
1. Getting Acquainted: Stellarium Software
2. Introduction to the Planisphere
3. Using Stellarium to Get Around on the Sky
4. Surface Features of the Moon
5. Motions of the Spheres
6. Equatorial Coordinate System
7. Phases of the Moon and Eclipses
8. Stars and Galaxies (counts twice as much as the other lessons)

The lessons generally have two parts, as follows:

1. The first part is about 10 questions and is intended to ease you into the new topic. You will usually have three chances to do the first part.
2. The second part is longer and is the core of the lesson. You will occasionally have just two chances.

Strategy: Work slowly and steadily on each lesson as soon as it becomes available. Do not wait until the day they are due! While working on each lesson, display both the lesson assessment and the corresponding learning module for helpful instructions. Make sure to click the “Save Answer” button below each question. You can then continue working on the lesson later without having to re-answer these questions. If you get stuck, then step back from the problem for a day, come back, and try it again. Or, you can ask your group members for assistance (but not for the answer). If you are still completely stuck, then let us (or your group members) know what you’ve tried, and we may be able to help.

As a reminder, lesson due dates are final. Start the lessons early! We are not responsible for any technical problems at your end or misreading of lesson due dates. Absolutely no extensions will be given for technical issues unless you notify your instructors about said issues at least three days before the assignment is due! Contact both course instructors if you have medical or related official documentation
that specifically clarifies your inability to work on a lesson.

5 Discussion Groups - 5% of course grade

Discussion groups (on Blackboard) represent groups of lab partners (like in a live lab). Each group is named after an important contributor to astronomy. You will be required to enroll in a group by the third week of class. All groups should ideally have three to five members. If you find that your group has less than 3 members, inform one of the instructors so that you may be moved to a different group. You must participate in the group throughout the semester to earn full credit on this part of the course. You are expected to use these groups to discuss the lessons and ask questions.

6 Order Your Planisphere

You will need to purchase a planisphere (a small, blue, two-sided cardboard star map) called “The Night Sky” for this course. The Emera Astronomy Center, at the University of Maine campus, in Orono, ME, will stock planispheres. This note is to give you all the details for purchasing a Night Sky for the course. The device can also be seen at: http://www.davidchandler.com/nightsky.htm

The planisphere is a star chart that can be used to identify stars and constellations and their location in the sky at any time of the year. The planisphere is not included in your course fee, so the Emera Astronomy Center has been asked to sell the planispheres from their gift shop.

Each planisphere is $6 including the tax. For those at a distance, we can mail it for $3 extra postage and handling (total of $9). The Emera Astronomy Center office is open most weekdays, so you can drop in between 10:00 a.m. and 3:00 p.m. to pick up a planisphere without mailing costs. A plastic version of the device that is much more durable is also available as an option for $11.

In either case, the Emera Astronomy Center can accept cash or check payment. If mailing, send payment to:

Gift Shop - Planisphere Order
5799 Emera Astronomy Center
167 Rangeley Rd
Orono, ME 04469-5781

For more information or questions on purchasing a planisphere, contact the Emera Astronomy Center, at (207) 581-1341, or through email: info@galaxymaine.com

Open some weekday hours in summer. Call ahead (207) 581-1341 to check office/shopping times and latest pricing.

If you have any further questions after reviewing the syllabus, feel free to email your instructors. Good luck on your voyage into astronomy!