VERTICALLY INTEGRATED PROJECTS (VIP): GALAXY EVOLUTION

Weekly All-Hands Meeting: Fri | PMA 15.202A | 4:00p-5:00p
or Zoom VIP Meeting Room: https://utexas.zoom.us/j/133251494

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What is the VIP program about?

The Vertically-Integrated Projects (VIP) Program operates in a research and development context. When you join our team you will earn academic credit for your participation in research efforts that assist faculty, postdocs and graduate students in their areas of expertise. The teams are:

Multidisciplinary - drawing students from multiple disciplines

Vertically-integrated - a mix of sophomores through PhD students

Long-term - each undergraduate student may participate in a project for up to three years and each graduate student may participate for the duration of their graduate career.

The continuity, technical depth, and disciplinary breadth of these teams are intended to:

Provide the time and context necessary for you to learn and practice many different professional skills, make substantial contributions to the project, and experience many different roles on a large, multidisciplinary VIP team.

Support long-term interaction between yourself and graduate students and postdocs, who will mentor you as you work on VIP projects embedded in their research.

Enable the completion of large-scale projects that are of significant benefit to faculty members' research programs.

VIP Learning Objectives:

By participating in the VIP program, you will gain first-hand experience performing astronomy research, including:

• Identify and grow your professional skills through practice and reflection.

• Make substantial contributions to the team project.

• Experience different roles on a large, multidisciplinary team.

• Gain skills in self-motivation and time management.

• Experience situations where the answer isn't known.

What is the focus of this research team?

This team focuses on galaxy evolution from an observational perspective. Using telescopes with imagers or spectrographs, we make observations to find and study distant galaxies, with an ultimate goal of understanding how our own Milky Way was formed. Our specific research typically focuses on the time of **_reionization_**, when energetic ultraviolet light emitted from the first stars and galaxies ionized the gas in the intergalactic medium (the material in between galaxies).

Some specific surveys we are presently using are:

- The Hobby Eberly Telescope Dark Energy Experiment (HETDEX). This is a large unbiased spectroscopic survey being led by UT using the 10m Hobby Eberly Telescope (HET) and its VIRUS integral-field unit (IFU) spectrograph. HETDEX is in the process of discovering over one million distant galaxies on the basis of their strong Lyman-alpha emission.

- The Cosmic Evolution Early Release Science (CEERS) Survey. This survey is also being led at UT, and will represent one of the first programs executed with the James Webb Space Telescope once it launches in Oct 2021. We are currently working on making predictions for what we will observe using simulated data.

What is required to participate?

- Some python coding and background astronomical knowledge is preferred. Example preparatory courses include AST307 and AST376R. However, membership is ultimately decided by the PI, so participation is possible without these courses if you believe you have the background knowledge.

- While we are remote in 20-21, it is easiest if you have a personal computer to use. We do a lot of our computer processing work on the machines at the Texas Advanced Computing Center (TACC), so your computer need not be new or fast. Once we are back on campus, the computers in the Astronomy Computer lab are more than sufficient for our needs.

What happens at the weekly meeting?

- During our weekly meeting we will first get updates from the designated sub-group reporter. We'll then let people volunteer to update. More senior members should update each week, while more junior members should be sure to update at least every 2-3 weeks. This gives you a chance to give an update on your progress, and ask questions about places you are stuck. I highly encourage other students to help answer these questions.

- Come prepared to present! You need not make a fancy powerpoint presentation, but you should come into the meeting with an outline of what you want to share, with figures loaded and ready. I encourage you to show figures as much as possible - it is much easier to diagnose a problem or give advice when you show us rather than describe the problem.

Are there other weekly events?

- Subgroups working on similar topics will also set-up required once-weekly meetings, where junior and senior members working on the same projects will problem-solve together. Students will rotate as the sub-group reporter, responsible for summarizing the sub-group meeting at the Friday team meeting.

What do I do when I'm stuck?

- The benefits of the vertical nature of this team is that there are a lot of people to ask for help!

    - Your first stop are more senior undergraduates within the team.

    - If they can't help you, then reach out to the graduate student or postdoc who is helping to supervise you.

    - If together you can't solve the problem, then reach out to the PI.

- Questions of a personal nature or any serious concerns can *always* be emailed directly to the PI.

How do I get compensated for my time?

The primary way VIP students are compensated is research credits. The expectation is three hours of work for each research credit you sign up for, up to a maximum of three credits, or nine hours.

There are two types of research credits: lower division (AST1/2/310K), and upper division (AST1/2/375, or a comparable class in your major).

To be eligible to take upper division credits in this VIP program, you must first take a minimum of three lower-division credits in this group, maintaining a minimum grade of "B" or higher.

A typical progression through the VIP program could look like:

- October of sophomore year: Admission to the program, begin attending weekly meeting.

- Spring of sophomore year: 1-2 lower-division credits, begin working on initial project.

- Fall of junior year: 1-2 lower-division credits, continue working on initial project, craft capstone project hypothesis.

- Spring of junior year: 1-2 upper-division credits, begin capstone project.

- Fall of senior year: 3 upper-division or honors (397H) credits, or 5-10 hr of paid position, continue capstone project.

- Spring of senior year: 3 honors thesis credits (397H) or 5-10 hr of paid position, complete capstone project.

Can I get paid instead?

During the long semesters:

Student's are heavily encouraged to seek out research funding from department, college, university, or other sources, which can allow you to be paid for your time rather than earn credit.

CNS resources are compiled here: https://cns.utexas.edu/tides/undergraduate/funding-opportunities

There is also a University Undergrad Research Fellowship: https://ugs.utexas.edu/our/scholarships/urf

> This is due Sept 28, or Feb 1.

There are two programs of note for students on financial aid:

> TEJAS Work-Study: https://cns.utexas.edu/tides/undergraduate/funding-opportunities

> University Leadership Network: https://studentsuccess.utexas.edu/uln/posting-opportunities

> ***If you qualify for either of these, please talk with me*

I do have a *small* amount of research funding available. This is unfortunately a non-renewable resource, and right now I have funding for 2-3 student-semesters per year over a three year period. This funding will thus be reserved for seniors who have completed their six credit-hours at a <u>high level</u>.

I recognize that everyone has different financial needs, and I do not want financial hardship to stand in the way of your ability to experience research. If you need to be financially compensated, but cannot locate a fellowship, please talk to me and we will try to find a solution.

During the summer:

For the summer students are encouraged to broaden their horizons via external REUs, though internal fellowship funding can be applied for should they wish to continue their research over the summer (available through TIDES and the department). Look out for emails on these opportunities, and if you are interested let me know by ~January (for example, TIDES has an Advanced Summer Research Fellowship, available for those who have worked in a team for two semesters, which this year was due early Feb).

How will I choose projects?

<u>Starter Project</u>: When you join the team after we do our application process mid-fall, you'll sit in on our group meetings for the rest of the semester, learning about what the groups are working on. At the beginning of the spring semester, the senior team members (senior undergraduates, graduate students and postdocs) will list potential starter projects. These will be designed to have you perform tasks which both give you exposure to various research techniques, but also provide a result which directly helps the senior member's project. You will work on this starter project through the fall of your junior year.

<u>Capstone Project</u>: During your first year in the program, take advantage of meetings and conversations to learn more about the work happening in the group, and to begin exploring your own curiosity. What questions come to mind? Which projects excite you the most? By the middle of your junior year, we will ask you to (with as much help from us as you want) come up with your ***own*** research investigation, which you will work on during the remainder of your undergraduate career. This capstone project should have a more rigorous nature than your starter project, with a true hypothesis and desired outcome. During the fall of your junior year, you should make time to talk to senior group members about ideas and questions you have, to help hone your research direction.

How will I share my research?

A key skill you will gain by being a part of this VIP group is the skill of sharing your research. You will do this in a variety of ways:

Internal presentations - you will present your work to the group weekly, and we will give you feedback to help you present with greater clarity.

Research Forum - you will be expected to present a poster (individually, or with your sub-group) at the annual CNS Undergraduate Research Forum (https://cns.utexas.edu/tides/undergraduate/undergraduate-research-forum). You are welcome to present at any other local events you find, just ask!

Winter American Astronomical Society Meeting - During your senior year, if you are interested, talk to me about applying for funding to attend this January meeting. This is particularly useful for those interested in graduate school in astronomy, as this can be a great networking event.

Publication - I will be very happy to work with you to publish your capstone project if you are interested. A most likely outcome would be a AAS Research Note (~1000 words + one figure), though a full peer-reviewed publication is a plausible stretch goal. This should be kept in mind when planning goals and your time commitment for your senior year.

How is my performance in the VIP group assessed?

The premise of VIP is teams working on projects. Much like a real-world team, individual members work on different aspects of the project. Team members range from sophomores through graduate students, from first-time participants to students who have been involved for four or more semesters. **The number of credits for which a student is enrolled is taken into account in grading**. Zero-credit students (reserved for paid participation only) participate in the same grading process. You must receive a grade of a B or higher to continue in future semesters. We will provide frequent feedback so that you are aware of your grade, as well as what could be done to improve it.

Performance assessments will be done once mid-semester, again at the completion of the semester. The mid-term assessment is advisory.

Success will depend on you being proactive and self-motivated!

Your grade is based on three areas, along with three requirements. Although each student contributes in different ways, you must demonstrate achievements in all three areas below.

1) **Documentation and records (35%)**

1) Maintain a VIP notebook. Scans of well-maintained VIP notebooks are available at http://www.vip.gatech.edu/vip-notebooks **Each student must understand that if work is not documented in his/her VIP notebook, "then you didn't do it,"** (i.e. work that is not documented in the notebook, including notes from meetings, will not count toward your grade). Some notebook tips:

Notebook Maintenance	• The notebook must be a bound notebook, ideally a composition book or lab notebook. While we are virtual, an electronic notebook is acceptable. • Your name, your project's name and your contact info must be recorded on the outer or inside cover. • Every entry should be dated. • Make sure to frequently include figures representing your work, or problems you're having!
To-Do List Maintenance	• Maintain check-boxes for items to be done. • Check-off and date items when done.
Meeting Notes	For meeting notes, include check-boxes for items for which you are responsible and deadlines for your sub team and the overall team.
Usability	Will your VIP notebook be of use to people who join the team later and need to refer to it? This includes legibility, intelligible technical and meeting notes, and organization.
Personal Reflection	Every few weeks, take the time to think about: How has my research progress gone? What challenges have I faced? What do I want to accomplish next? What professional skills did I need to leverage over the past week or so? Take some notes on these reflections.
Overall	An overall rating of your notebook. (Detailed design notes, design decisions, copies of or pointers to code that you wrote, records of important websites, etc.)

2) **Personal accomplishments and contributions to you and your team's goals (35%)**

Engagement in project; Pursuit of knowledge necessary for project; Contributions to the technical progress of the team; For more experienced members of the team, contributions to the management of the project (e.g., leadership) may be expected.

3) **Professional Behavior (20%)**

On-time attendance in meetings; Actively contributes to overall team goals; Coordinates activities with other team members; Assists other team members.

4) **End of semester presentation (10%)**

Team presentations (mid-term and final) Peer Evaluations; On-time attendance in meetings; Actively contributes to overall team goals; Coordinates activities with other team members; Assists other team members.

VIP Etiquette

Digital Classroom: All classroom norms apply when in a Zoom session.   If you wouldn't do something in a physical class, don't do it in a digital classroom.

   Please ensure that your microphone is working before our meeting. <u>Mute your audio whenever you are not speaking.</u>

   Be sure to give your peers your attention while they are talking. Peer interaction is a big goal of this group, so I expect you to be asking questions and providing suggestions.

   If you are comfortable with it, I encourage you to keep your video on to help us maintain a personal connection. You may use video and Zoom backgrounds if your device allows, but they must be appropriate. If I ask you to change your background, you must do so immediately.

Expectations regarding mutual respect: Astronomy belongs to all people, independent of race, religion, gender, gender identity, gender expression, or sexual orientation. Incidents of discrimination, assault, harassment, threats, intimidation, profiling, or coercion based on membership or perceived membership will not be tolerated. Show each other respect no matter perceived knowledge or performance in this class, or any other.

Communication: We will communicate via email and Slack. Email is recognized as an official mode of university correspondence; therefore you are responsible for reading your email for university and course-related information and announcements. Please check your email regularly and frequently, and make every effort to stay up-to-date on Slack.

VIP Schedule Outline:

We will always meet weekly to discuss progress, but in this calendar I highlight some specific events and milestones.

Week #	
1: Jan 21	Introductions, Overview of teams' previous work, Discussion of semester goals, Begin discussion of starter projects
2: Jan 28	Bring VIP notebook to meeting (and all future meetings).
8: Mar 11	Due: Turn in notebook with self-graded rubric.
9: Mar 19-25	Individual 10 minute meetings to go over evaluations, notebooks returned
15: May 6	Final presentations; Turn in VIP notebooks at team meeting for final grading
Finals Week	Individual 10 minute meetings to go over final grades, notebooks returned

University Resources:

Student Support: ***COVID-19 Update: "Keep Learning" Resources***: This course may be offered in a
       format to which you are unaccustomed. If you are looking for ideas and strategies to help you feel

more comfortable participating in our class, please explore the resources available here: **https://onestop.utexas.edu/keep-learning/**

Academic accommodations (SSD): This class respects and welcomes students of all backgrounds, identities, and abilities. If there are circumstances that make our learning environment and activities difficult, or if you have medical information that you need to share with me, please let me know. I am committed to creating an effective learning environment for all students, but I can only do so if you discuss your needs with me as early as possible. I promise to maintain the confidentiality of these discussions. Any student with a documented disability who requires academic accommodations should contact Services for Students with Disabilities at 471-6259 (voice) or 512-410-6644 (Video Phone) as soon as possible to request an official letter outlining authorized accommodations. For more information, visit **http://ddce.utexas.edu/disability/about/**. *I am also happy to meet in person virtually over Zoom to discuss more.*

Counseling and Mental Health Center: Do your best to maintain a healthy lifestyle this semester by eating well, exercising, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle. You are not alone. There are many helpful resources available on campus and an important part of the college experience is learning how to ask for help. Asking for support sooner rather than later is often helpful. If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support. **http://www.cmhc.utexas.edu/individualcounseling.html**

The Sanger Learning Center: Did you know that more than one-third of UT undergraduate students use the Sanger Learning Center each year to improve their academic performance? All students are welcome to take advantage of Sanger Center's classes and workshops, private learning specialist appointments, peer academic coaching, and tutoring for more than 70 courses in 15 different subject areas (including Astronomy). For more information, please visit **http://www.utexas.edu/ugs/slc** or call 512-471-3614 (JES A332).

University and Course Policies:

Academic integrity: The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties. Ethical conduct is expected at all times. For example, answering Voting Questions to receive credit when you are not in class is unethical. Incidences of academic dishonesty will be reported to Student Judicial Services. For more specific information go to: http://deanofstudents.utexas.edu/conduct/academicintegrity.php.

You are responsible for understanding UT's Academic Honesty and the University Honor Code which can be found at the following web address: **https://deanofstudents.utexas.edu/conduct/standardsofconduct.php**

Plagiarism: As a research university, the University of Texas at Austin takes plagiarism very seriously. Do not risk getting involved in a plagiarism infraction - the consequences simply aren't worth it. Always cite your sources, and when in doubt consult a professor or librarian. You may also read

more about plagiarism at the Student Judicial Services website: http://deanofstudents.utexas.edu/conduct/academicintegrity.php

Personal or Family Emergencies: If you experience a personal or family emergency (death in the family, protracted sickness, serious mental health issues) that prevents you from attending an exam or forces you to miss multiple days of class, you should contact Student Emergency Services in the Office of the Dean of Students http://deanofstudents.utexas.edu/emergency/. They will work with you to communicate with your professors and let them know of your situation.

Religious Days: A student who is absent from a class or examination for the observance of a religious holy day will be permitted to make up the missed work, if notice is given at least fourteen days prior to such an absence.

Classroom Safety and COVID-19

This is a science classroom and we are strongly recommending that we look to the science and follow the guidance of local public health officials and the CDC. Wearing a mask indoors is strongly encouraged, even if you are vaccinated, especially while Austin is in Stages 3 or higher, as masks efficiently reduce the spread of COVID 19. ***To help preserve our in person learning environment, the university recommends the following:***

- Adhere to **university mask guidance** and follow the recommendations of the CDC. ***Our class will be the most successful if we all protect and respect each other and wear a mask.***

- **Vaccinations are widely available**, free and not billed to health insurance. The vaccine will help protect against the transmission of the virus to others and reduce serious symptoms in those who are vaccinated. The vaccines are safe, and effectively prevent against severe illness from COVID-19.

- If you are experiencing any symptoms of COVID-19, please follow university guidelines here: https://healthyhorns.utexas.edu/coronavirus_exposure_action_chart.html, including getting tested. If you test positive, you should isolate yourself at home. Contact the Behavior Concerns and COVID-19 Advice Line (BCCAL) to report your positive result. BCCAL can also assist you with isolation options, class absence notification or other support.and if you find out that you have a positive test for COVID-19.

- If you are experiencing any symptoms of COVID-19 ***do not come to class in person***. If you are well enough to attend via zoom, please do. If not, you can use one of your six drops.

- **Proactive Community Testing** remains an important part of the university's efforts to protect our community. Tests are fast and free, and I recommend testing at least once weekly.

- It is possible that due to multiple student cases of COVID-19 we will need to move online for a period of time. Due to FERPA I cannot reveal information about these cases, but please know that if we do move online, it is for all of your safety.

- Visit **protect.utexas.edu** for more information.

UT Austin Galaxy Evolution Vertically Integrated Projects Notebook Rubric
PI: Steven Finkelstein

Student Name   FR   SO   JR   SR   Credit Hours   Semester

Circle one

		Poor	**Average**	**Exemplary**	**Point Range**	**Points Earned**
Documentation	What was done each week	Very liittle explanation of work, little progress, few interactions, few meeting notes for each week.	Adequate explanation of work, progress, interactions and meeting notes for each week. Someone knowledgeable in this field would be able to: - Understand decisions you made - Repeat what was done - Obtain the same result	Same as previous *AND* Includes reflections on: - What did or didn't work - Next Steps	0-10	
	Evidence					
	To-do list for upcoming week	Not consistently created each week.	Created each week *AND* Completed items checked off	Same as previous AND Easy for reader to understand AND Items checked off and dated	0-10	
Contributions	Evidence					
	Personal contributions to the project	*Accounting for the student's experience, year in school, and number of credit hours*				
		Very few contributions OR The work was too simple OR The word did not advance the project or help you gain skills that would advance the project.	Adequate contributions *AND* The work advanced the project and/or helped the student gain skills needed to advance the project.	Same as previous AND Outstanding contributions.	0-10	
	Evidence					

Total:

UT Austin Galaxy Evolution Vertically Integrated Projects Presentation Rubric
PI: Steven Finkelstein

_____   FR   SO   JR   SR   _____   _____
Student Name   Circle one   Credit Hours   Semester

The goal of the semester-ending VIP presentations are to share what you have accomplished through the semester. These should be organized with a slideshow software (e.g., powerpoint, google slides). Presentations should include a clear introduction to the topic, a description of what you did, and a conclusion including a reflection of the lessons learned. The slides should be well organized, with frequent well-labeled visual supporting material. The presentation should be clearly spoken, with a compelling delivery, and should fit within the allocated time (we recommend you practice at least a few times!).

	5	3	1	Points Earned
Organization:	Presentation was within the time limits, organized with a clear introduction, discussion of analysis, and conclusions and reflection.	Presentation well structured, but time not managed well, or sections missing or incomplete.	Presentation unclear, not organized, well under or over time limit.	
Clarity	Speaker is clear, slides are clear and structured so that they are easy to read/follow.	Speaker is clear, but slides lacking some clarity.	Speaker unclear, slides poorly constructed.	
Supporting Material	A variety of types of supporting materials (e.g, figures) make appropriate reference to information or analysis that significantly supports the presentation.	Supporting materials are used, but are not fully explained, and/or the link to the material is not clear.	Supporting materials are not used.	
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced, but is not explicitly stated in the presentation.	
Total				