

Summer research strategies*

AeroAstro dREFS lunch

** This is a working meeting to share resources and collaborate on ideas and techniques- we aren't experts any more than you!*

Where are you at in your research right now?

How have your previous summers of research been?

What are you hoping to get out of this hour?

MIT & AeroAstro Policies on Vacation and Summer work

Vacation

- Grads get at least 2 weeks and Institute holidays per year -- check with advisor/peers
- Vacation schedule must be approved by their supervisors
- [MIT Policies](#)

You get a 16.THG grade for Summer

- [AeroAstro Doctoral Handbook](#)
- No formal progress evaluation like in the Spring/Fall

Summer internships

- Involves advisor-approved withdrawal from MIT.
- On a leave of absence/withdrawal, international students need their visa sponsored by the company they are interning for

PhD progress measured in Spring and Fall terms

- *Example:* “The thesis proposal and proposal defense should be successfully completed at most three regular terms (a regular term is a Fall or Spring term) after being admitted to the doctoral program.”

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Upshot Expectations for summer productivity are primarily set by you and your adviser collaboratively; this is a time when you can prioritize projects or skills that will drive your next academic year.

Do you understand your PI's summer expectations?

Are you planning to go on vacation this summer?

What are you hoping to accomplish this summer?

Goal Setting

Guidelines SMART+

- **Specific** | who, what, when, where, which, why
- **Measurable** | metrics for meeting goals
- **Achievable** | priority setting and obstacle identification
- **Relevant** | fitting into the bigger picture
- **Time-bound** | deadlines and urgency
- **Plus** | accountability and context

Types of Goals

- Complete a project
 - Formulate a research direction/problem
 - Write
 - Create
 - Experiment
- Learn a skill
 - Develop/Code
 - Practicing
 - Benchwork
 - Teach

Frameworks for Success

- Working groups
 - *Example:* MIT [Writing Together Online](#)
- Setting subgoals/milestones
- Mindful daily “prep” and “cool-down”
- Share your goals with others
- Record your progress

Goal Setting -- *Example* -- Completing a project

Specific | I want to complete a data analysis pipeline that combines, filters, and provides insights about (e.g., cross correlations, distribution statistics) field collected data from multiple robotic sensors in order to address the key hypothesis of the field mission that methane can be used as tracer for hydrothermal activity. **[S is about actions like “oversee,” “update,” “write,” or “process”]**

Measurable | The pipeline must be reviewable by external collaborators through a shared github repository (review request created via PR), and yield a single fused dataframe of all sensor data interpolated onto a common time value. The pipeline must also yield several high-priority analyses, including: distribution plots (histograms, boxplots) and cross-correlation grids (global and rolling). **[M requires some form of “data” and “collection” method -- automated reports, audits, tests, surveys, actual products (e.g., PRs) are all possible options].**

Achievable | The pipeline can be developed via python using data aggregator pandas, analyzers scipy and ruptures, and plotter plotly. All data is already in hand. Code repository is created, and reviewer identified. Possible obstacles are related to handling of certain proprietary data streams; adviser can assist if necessary. **[A focuses on the logistics of the goal]**

Relevant | For my thesis, this analysis will serve as a means of motivating informative sample collection and the analysis will be used for future field work processing. This data will be used directly in a publication. **[R focuses on priority and utility of the project for you]**

Time-Bound | The publication of this data is due on June 30th; data processing should therefore be complete by June 15th. This is reasonable based on the large amount of prior work I've completed for a similar pipeline that can be recycled. **[T focuses on how long this will take; motivate whether that duration is reasonable with hard evidence and prior experience]**

Plus | I've shared this timeline and goal with my adviser and the external code reviewer who will dedicate time to it when it is complete. I'm keeping track of my progress via Trello. I have other work to complete in this time period, but I've dedicated 2hrs/day for this work to make steady advancement towards the deadline. **[+ is about accountability and context]**

Goal Setting -- *Resources*

- [Guide from University of California](#)
 - [Fillable worksheet from University of Colorado](#)
 - Reflections on [setting goals in graduate school](#)
 - [MIT Teaching and Learning Lab](#)
 - [MIT Writing Together Online](#)
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- [Goal Setting Worksheet](#)

Meeting with your advisor

Discussions could focus around these possible main topics

- Research
 - Goals, resources, feedback
- Academics
 - Classes, workshops
- Logistics
 - Vacation, hours, deadlines
- Career
 - Plans and goals after MIT
- Trickier topics
 - Initiating advisor or topic changes
 - Sharing personal or MIT related concerns

How can one prepare for an advising meeting?

- Slides
- 1-pager
- Whiteboard discussion
- Agenda setting
- Practice with a labmate or dREFS
- ...

Research “Stages” and Self-Direction

Research Activities

- **Project Formulation**
 - Reading and brainstorming
- **Project Development**
 - Prototyping
 - Testing
 - Iterating
- **Project Sharing**
 - Writing
 - Presenting
- **Developing Collabs**
- **Motivations** in early and late graduate school can change!

Organizational Tools

- **Project formulation**
 - Annotated bibliographies
 - Mendeley, Endnote, Zotero
 - “Ruminations” notebook
 - Jupyter, markdown, google docs
- **Development**
 - Scrum/Agile
 - Trello, Jira
 - TODO lists & calendars
 - Explainers/Journal
 - Jupyter, markdown, google docs
- **Sharing**
 - Collaborative writing & presentations
 - Overleaf
 - Blog posts

Day to Day

- [Three to Thrive](#) (3 weekly SMART+ subgoals)
- Collaborative work-time meetings
- Set a daily intention or perform daily “rituals” (e.g., cleaning your desk, silencing slack) for habit forming
- Time block or Pomodoro
- Distraction blockers
- Ask for feedback!

Getting Support

- **Reimbursements for this event:** Send itemized receipts to {ameredit, remorgan}@mit.edu
- **Practicing advisor meetings:** email aeroastro-refs@mit.edu to schedule a one-on-one or visit <https://forms.gle/F2gQopShavpFFm9V9>
- **Support groups:**
 - Academic/Writing: <https://cmsw.mit.edu/wcc-writing-together-online/>
 - Health and Wellness: <https://medical.mit.edu/group-counseling>
- **MIT resources:**
 - International Students: <https://iso.mit.edu/>
 - Career Planning: <https://oge.mit.edu/student-support-development/career-planning/career-planning/>
 - LOA, Withdrawal and Readmission: <https://oge.mit.edu/gpp/admissions-and-registration/registration-changes/withdrawal-readmission/>