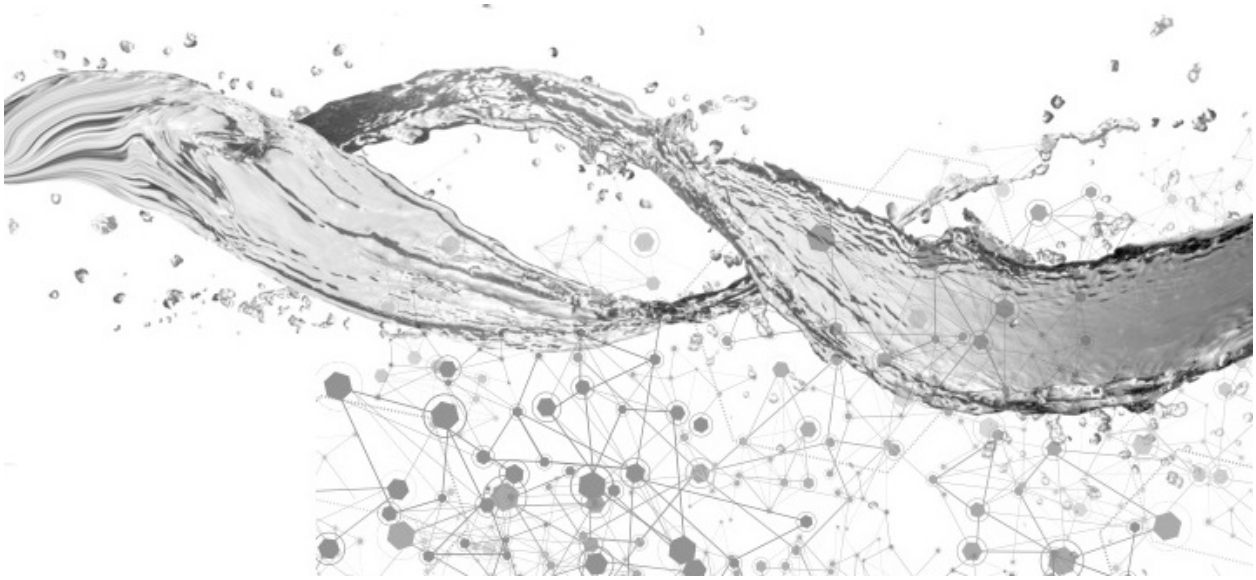
PINTO RESEARCH GROUP HANDBOOK



PI: Ameet J. Pinto, Ph.D.
Email: ameet.pinto@ce.gatech.edu
Office: Ford EST Building, Rm 3226
Laboratory: Ford EST Building, Rms 3351, 3353, 3355

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1.0 OVERVIEW

1.1 VISION

Our vision is to create and advance microbial management frameworks to maximize the benefit and minimize the detriment of microbial communities towards infrastructure, environmental health, and public health.

1.2 MISSION

1.2.1 Research mission

We investigate and manage microbial ecosystems at the interface of infrastructure and public / environmental health with a focus on the engineered water cycle.

Our goal is to characterize and manipulate microbial communities to (1) protect and improve public and environmental health and (2) improve functional reliability and economic feasibility of water infrastructure. To this end, we develop and implement tools, methodologies, and models to characterize, manipulate, and leverage microbial communities in the engineered water cycle.

1.2.2 Professional development mission

We train engineers and scientists at the interface of biotechnology, ecology, and microbiology to positively impact society through meaningful and innovative fundamental and applied research in the water sector that improves and protects environmental and public health.

1.3 RESEARCH GROUP CULTURE

We aim to maintain a research group culture that rewards curiosity and initiative, values diversity and collaborations, practices inclusiveness and empathy, and fosters mutual trust and respect.

2.0 ROLES AND EXPECTATIONS

2.1 PRINCIPAL INVESTIGATOR.

My primary role as the Principal Investigator of our research group is to ensure that we deliver on the groups vision over the long term and to manage the research and professional development mission in the short-medium term while working with the group members to foster a supportive and open group culture. Here is how I see this breaking down in a more practical way.

Mentoring: It is my role to facilitate and support the professional and scientific growth of group members. To this end, my responsibilities are to work with group members to develop and help implement a research and education plan that (1) meets the deliverables of the project that the group member is supported on, (2) provides group members with the training and training opportunities that helps them gain the expertise they need to deliver on their research projects and helps them move towards their career goals, (3) helps group members navigate short- and long-term challenges working in an academic research environment, and (4) prepares them for their chosen professional careers. Mentoring is a collaborative process and requires that there is open communication built on trust and mutual respect. Thus, a successful mentor-mentee relationship requires time, energy, and trust investment from both.

This is what you can expect from me:

- I will work equally hard to facilitate the success of each group member and do my best to tailor my efforts to each group members unique needs as much as possible.
- I will help you grow as a researcher. I will help you develop the skills and find appropriate resources to help you learn how to develop and execute experiments, interpret data, and disseminate outcomes through presentations and publications and communicate their impact.
- I will be available and prepared for routinely scheduled meetings based on the agenda and progress report prepared by group members. I will also be available for informal “drop in” conversations, however my availability for this might vary from time-to-time.
- I will work with you to develop a graduate plan of study that meets your training and career aspirations. While I expect you to be on top of deadlines and requirements for individual programs, I will help you select courses, committee members for exams, identify training/conference/workshop opportunities that best align with your goals.
- I will encourage you to attend conferences, workshops, and professional meetings and provide the resources necessary for you to attend these as outlined in the conference and workshop attendance policy section.
- I will be your advocate. I will do my best to help find a solution to any problems you may have as part of the research group.
- I am committed to mentoring you and supporting your success even after your leave the research group to the extent you chose. I will write letters of recommendations for you, nominate you for awards and honors, and help you network to further your career goals. I will be invested in and rooting for your success long after you leave the research group.

Funding: It is my role to ensure that group members have the required resources to successfully deliver on research projects. To this end, it is my responsibility to ensure that all group members

are financially supported for their undergraduate/graduate/post-graduate research; the extent and type of financial support varies depending on research stage. Specifically, undergraduate and M.S. researchers are paid on an hourly basis, graduate students enrolled in the doctoral program are supported through set monthly stipends, benefits, and tuition coverage, while post-doctoral researchers are supported through negotiated salaries, relocation allowance (as appropriate), and benefits. In addition, funding is required to buy/maintain laboratory instrumentation/software, perform experiments, publish research, and support professional development activities such as conference/workshop travel. One of my key responsibilities is to make sure that research group members are fully financially supported in all aspects. Further, there are also several funding opportunities for group members to secure their own independent funding. We have compiled a list of these funding opportunities in the shared group Dropbox Folder titled "Award_Fellowship_Application". I can help you identify the correct opportunity and timing and mentor you through the application process. You can also find examples of previous applications for various fellowships/awards/competitions submitted by current members and group alums.

Diverse, inclusive, and a growth environment: We benefit when all group members feel equally seen, heard, and respected. I will work to cultivate that environment by leading by example and ensuring that all group members feel supported for their unique needs and contexts to the best of my abilities. What this also means that I will not tolerate any discriminatory or abusive behavior in the group. If a group member feels discriminated against based on race, religious beliefs, gender/gender identity, sexual orientation, ethnicity, or nationality or other protected criteria, they can feel safe in expressing this to me knowing full well that I will take appropriate actions, based on Georgia Techs policies. Further, a growth environment does not mean a conflict or disagreement free environment. Disagreements and sometimes conflicts are inevitable in any team; what separates a growth environment from one that is not is how these are resolved. While conflicts/disagreements are ideally resolved between group members at the earliest opportunity possible through open communication, if there is a need for me to be step in – I will do my best to facilitate an impartial resolution. Remember, we are a team.

2.2 GROUP MEMBERS

The term graduate researcher refers to those students enrolled in a Ph.D. or M.S. program at Georgia Tech. The term post-doctoral researcher refers to those working in the group with a Ph.D. degree. The term undergraduate researcher refers to those working in the group prior to obtaining their B.S. degree. While my role is to facilitate your professional and scientific growth and help prepare you for your desired careers, I cannot do the work required for you; I can only facilitate this. Below are the roles and expectations for researchers in the group:

2.2.1 All Group Members

Academic research is a unique opportunity to cultivate focused expertise on a specific topic/domain while developing a broad technical experimental and/or computational skillsets. The expected outcome of a graduate/post-doctoral research experience in our research group is new and impactful knowledge creation and trained professionals that benefits society and independent. The knowledge creation itself can take many forms but key (and measurable) outputs such as peer reviewed publications and/or patents are essential. Academic research is

also an important opportunity to cultivate skills that are more challenging to quantify but essential; these include creativity, focus, critical thinking, the ability to see the big picture and work on the fine details, the ability to communicate your research to experts and the lay public, etc. Some of these skills will need your active attention to cultivate, while some may develop on their own – this is person dependent. We will have a "live" list of reading material on development of soft skills in the academic research environment in the shared group Dropbox Folder titled "GT_resources". Your responsibility is to use this opportunity of research in our group and at Georgia Tech to grow into the scientist/engineer/innovator that you desire to become. Below are some expectations and responsibilities that I think will empower you to meet their personal goals.

- **Plan:** You are expected to plan your research – experiments, timeline, outputs, etc. I will work with you on this – but I expect that you will take the lead. This is particularly helpful as you make decisions on how to allocate time on a weekly basis.
- **Organize:** Group members are expected to keep detailed records of research notes, code, and experiments. When you leave, all hard copy laboratory/experiment notes must stay behind in the laboratory; you are welcome to make copies of them to take with you for your own record. All code should be maintained either on GT cluster or (preferably) on GitHub. Backup work-related materials from your laptop on a weekly basis on an external hard drive and keep the external hard drive in your work office. Group members leaving the research group should create a "Read me" guide that documents type and location of samples, reagents, data, and code in a word document along with photos when appropriate.
- **Read:** Group members will make an active effort to keep up with literature in their field. Keeping up with literature is the best way (1) to avoid repeating research that has already been done, (2) build on the work of others, and (3) generate new ideas. It is also helpful to read papers outside your own immediate focus area. This can help you identify and borrow ideas from other fields and apply it to your own research questions. Since our research group works in specific thematic research areas, we will endeavor to make "essential reading list" library so that incoming group members will benefit from this.
- **Ask**: You are expected to ask questions while conducting research. Why is your research important? How does this method/tool work? Does this data make sense? Get into the habit of asking why, how, and what for? This is one of the best habits you can cultivate as part of your research experience.
- **Be courteous:** Be courteous to your group members. When you schedule an experiment, analyses, or instrument use, schedule enough time to clean up after yourself. If you are too busy to clean up after yourself after completing an experiment or analyses in the laboratory, then do not perform that experiment/analyses. If an instrumentation breaks, then inform me and we can develop a plan to fix it. Also, leave a "do not use" note on the instrumentation.
- **Publish:** Our research is largely taxpayer funded and we have an obligation to share our findings with the scientific community and the public at large through peer reviewed publications. Publications serve not only to disseminate your research but demonstrating productivity with respect to papers is also critical to ensuring research proposals for future work are considered credible by reviewers. I will push you to publish your work during your graduate or postdoctoral work and not just at the end. The expectations in terms of

publishable output vary depending on career stage and are outlined separately for graduate and post-doctoral researchers. Also know that quality trumps quantity and research impact trumps journal impact factor. While journal impact factors are regarded as indicators of the quality of the work published, not all papers published in high impact factor journals are good quality. Our aim should be to publish excellent work in excellent journals. Thus, publishing fewer papers is fine provided they are more substantial in their contribution. Georgia Tech also has several resources and trainings on writing scientific papers; do take advantage of these. We will have a "live" list of resources at Georgia Tech in the shared group Dropbox Folder titled "GT_resources".

- **Deadlines:** Set deadlines for your work and strive to meet them. We will establish mutually agreed upon deadlines for each phase of your work through one-on-one meetings. There is always a balance between coursework and research, especially early during your graduate studies. However, on the aggregate, you should organize your work schedule such that you are working to meet these deadlines.
- **Schedule:** You can largely set your own work schedule if you are meeting expectations. However, I do expect that you will spend enough time in the lab/office during normal work hours to allow for interactions with other group members. This will ensure that group members get to know each other and learn from each other. This is a critical part of academic research experience. I also do not believe in being prescriptive of the expected number of hours per week that need to be spent on research. This can vary wildly depending on your course load (if graduate student), stage of research, time of year, etc. My personal experience during graduate school and postdoctoral work (and also faculty life) is that the hours spent on course work + research-related + professional development/service activities can vary anywhere between 30-60 hours per week depending on time of year. The best thing might be to do is for graduate researchers to aim for 40 hours per week on graduate degree related activities (course work, research, etc.) and for postdoctoral researchers to aim for 40 hours per week in research-related (including mentoring) activities.
- **Communicate:** I expect that you will maintain open and clear communication with me and other group members. If you are struggling with any aspects of your work, talk to me promptly. I can help find ways to resolve these issues. If you have personal challenges that are affecting your work, talk to me promptly. You do not need to disclose anything you do not want to disclose about personal challenges, but if your work is being impacted, I should be made aware of this.
- **Mentor:** Post-graduate and senior graduate researchers are expected to mentor and train junior graduate researchers; this unique training experience benefits both equally.
- **Build collaborations:** You are at one of the top engineering schools in the world with some of the best resources and scientists. Group members are encouraged to proactively identify potential collaborations that may benefit their projects. Discuss your collaboration ideas with me before acting on them by reaching out to potential future collaborators.

2.2.2 Graduate Researchers.

Graduate researchers must take ownership of their educational and research experience at Georgia Tech. This includes ensuring that the appropriate courses and exams (i.e., qualifying

exams, proposal/thesis defense) are taken in a timely manner and that they show commitment, professionalism, engagement, and maintain high ethical standards while fulfilling different components of their degree requirements. Here is what it breaks down to in a practical perspective.

- **Coursework**: When you join Georgia Tech, find out what the course requirements are for you. These can vary a bit depending on your major and your graduate stage (i.e., B.S. headed to Ph.D. program or M.S. headed to a Ph.D. program). The best point of contact to obtain this information is the program coordinator for your specific degree program. You can review the latest CEE Graduate Student Handbook here. Once you have this information, we can work together to plan out the courses (1) you will need to take as part of the degree program, (2) ideal to take to help develop expertise for your research project, and (3) courses that will help build skills/expertise that you would like to further develop and their timing. Ideally, you will complete this process within the first month of arriving at Georgia Tech knowing well that courses in categories 2 and 3 may change as you progress along your degree path.
- **Courses**: The expectation is that graduate researchers will be professional and engaged in the classroom and laboratory. The course work will be delivered by experts in a topic often with many years of experience on the subject matter. Take advantage of this opportunity.
- **Degree specific deadlines**: In addition to course work, graduate degrees have additional requirements. This includes passing the preliminary exam, proposal defense, and dissertation defense. Identify these key exams and the expected timelines per your degree program. While the dissertation defense can be flexible, the timeline for the other exams is usually prescriptive. Identify these timelines early in your degree and make them part of your course work planning.
- **Publications**: The expectation is that Ph.D. students will have published or submitted for review at least three first author papers and have co-authored two-three more through collaboration with other group members or external research collaborators prior to graduation. Students pursuing a M.S. degree are expected to author one paper or make a substantial contribution to at least one journal paper in submission prior to graduation.
- **Mentorship and training:** Graduate researchers are expected to actively participate in mentoring and training of researcher's junior to them. These activities typically include (but not limited to) (1) training on experimental and computational methods used in research projects, (2) brainstorming ideas for experiment, (3) providing feedback on manuscripts, presentations, and posters, and (4) navigating the academic research experience. While this does require some time commitment, the process of mentoring of junior researchers has significant benefits for the mentors as well in terms of professional growth.

2.2.3 Post-doctoral researchers.

Post-doctoral researchers in the group are likely pursuing an academic career (i.e., faculty position) trajectory. And thus, their training in the research group and expectations are most likely tailored to allow a smooth and successful transition to an academic career. Thus, most outlined expectations below are structured with the goal of transition to an independent academic career. However, this does not have to be the case for everyone, and I am happy to develop a set of

expectations and training plan that better suits your career aspirations even if they change during your time as a post-doctoral researcher. Here is what it breaks down to in a practical perspective.

- **Publications**: Post-doctoral researchers are expected to lead on ≧1 paper per year as first author and co-author 1-2 per year through collaborative work with other group members or external research collaborators.
- **Mentorship and training**: Postdoctoral research are expected to actively participate in mentoring and training of researcher's junior to them. These activities typically include (but not limited to) (1) training on experimental and computational methods used in research projects, (2) brainstorming ideas for experiment, (3) providing feedback on manuscripts, presentations, and posters, and (4) navigating the academic research experience.
- **Proposal writing**: Securing funding for research ideas is essential part of an academic research laboratory. Successfully structuring and presenting those ideas for various research agencies/research calls is a skill set that requires practice and patience. One of my roles as the group PI is to ensure post-doctoral researchers have the appropriate training in proposal writing to allow them to successfully launch their own independent academic careers. I will facilitate this by inviting post-doctoral researchers to contribute to research proposals that I am developing. Further, post-doctoral researchers are also encouraged to identify and apply for funding opportunities that are specifically designed to initiate an independent academic career (e.g., NIH pathways to independent awards). I will be happy to support this activity as best as I can (e.g., feedback on proposals, brainstorming ideas, helping make professional connections etc.).
- **Professional development**: Georgia Tech has several programs designed for new incoming faculty on leadership, group management, proposal writing etc. – these cover nearly every aspect of a new faculty position. These programs are offered at the institute, college, and school level and are nearly always also accessible for post-doctoral researchers. Post-doctoral researchers in the group are expected to take advantage of these training opportunities. We will have a "live" list of resources at Georgia Tech in the shared group Dropbox Folder titled "GT_resources".

3.0 MEETINGS, REPORTING, AND COMMUNICATIONS

3.1 MEETINGS.

Individual meetings: Individual meetings are an opportunity for in-depth discussions about research goals/progress and professional development goals. Group members are expected to upload the weekly progress reports to their "weekly reports" folder in the group Dropbox folder by one day prior to their scheduled weekly meeting. This gives me the opportunity to review and reflect on your report prior to meetings.

Group meetings: Weekly group meetings are an opportunity for the entire group to come together at one time and interact on a single topic; these are very important and group members should avoid missing them. We usually do not start meetings unless everyone is present. So, if you are unable to make it to any group meeting, do let me know in advance. The agenda for the group meetings is established at the first group meeting of each semester and these include a mix of journal clubs, research updates, invited presentations, training, etc.

3.2 REPORTING.

Weekly progress reports: Group members are expected to submit a weekly report to summarize their weekly research activities and outline planned work over the upcoming week. The typical format of the weekly report should include (1) what I did this week, (2) what I plan to do next week, and (3) key challenges/support needed. Writing the weekly report is an opportunity to reflect and summarize your activities over the week; take time to do this (~1 hour per week) and go into as much detail as possible. The weekly reports also establish the agenda for discussion during weekly individual meetings. Please note that weekly reports are maintained in a Dropbox folder that is accessible to the entire group. If there are items you would like to discuss in confidence, please include them in a separate email to me or via DM on group workspace on Slack.

Annual progress report and evaluation: Group members are expected to compile an annual progress report prior to the start of the Fall semester that summarizes their progress over the previous academic year and outlines the milestones and plans for the next academic year. An annual progress report template is provided in the shared group Dropbox Folder titled "GT_resources". We will meet prior to the start of the fall semester to discuss your progress and goals based on this annual progress report. At this time, you should outline any aspects of your graduate or post-graduate experience that you are unhappy with. I will do my best to help you resolve this. We should also discuss any concerns you have with respect to my role as your advisor; be candid as this is my opportunity to hear any major concerns and work to support you the best I can. I will also be candid about my assessment of your progress. It is my responsibility to identify any deficiencies and help you determine strategies to resolve these before they become major issues.

3.3 COMMUNICATIONS

Communications within group: We use a combination of email and Slack for communication within the research group. Day to day communication should happen on slack, while email should be associated with formal communications (i.e., institutional communications) or communication

with external collaborators. Our group currently uses a free version of Slack where files/attachments associated with older messages are automatically removed and become inaccessible. Thus, minimize the transfer of files/documents on Slack as much as possible and instead send them via email. Slack does not have a “read” feature, where the someone posting a message knows if it has been read by the intended recipient. To help with this, I recommend that if you read a message on slack indicate it by using a reaction emoji of your choice.

I do not expect a response from group members to my emails or slack messages sent outside of working hours (i.e., before 8 am or after 6 pm). But get back to me within a day or so during working hours. I will also stick to this policy in responding to you. We also maintain a google spreadsheet with group members contact information including cell phone numbers. If it is an emergency, contact appropriate group members (including me) by text message or phone call if there is no response via email or Slack in a timely manner. We are generally informal in terms of addressing each other in the group (i.e., first name basis) unless requested otherwise by any group member in which case, respect their request.

Communications outside group: Communications outside the group are likely to be largely administrative in nature, potential or current research collaborations, or communications with vendors etc. If you are sending an email to someone for the first time, refer to them formally (i.e., Dr., Prof., Mr. Mrs., etc.). Do not start off professional communication with someone new on a first name basis especially if they are senior to you. Pay attention to how they sign their email in response to yours to determine how to address them going forward. You do not need to cc me on all communications associated with administrative or research purposes but do cc me emails that initiate a new administrative or research issue/topic.

4.0 GROUP LOGISTICS

4.1 LABORATORY SAFETY AND TRAINING

All group members must complete the required trainings prior to beginning laboratory-based research and while doing so comply with all health and safety requirements as outlined in respective training. SAFETY FIRST. Please review the Laboratory Safety Manual maintained by GT Environmental Health and Safety here. When you start in the research group, we will work together to identify all the trainings that you are required to complete before starting work in the laboratory. We will use this link to identify the appropriate trainings. Visit the Environmental Health and Safety website (https://www.ehs.gatech.edu/home) to sign up for required training modules.

While some training modules are one time, there are others that require refresher trainings. Once you complete a required training, email the proof of completion (i.e., certificate or email indicating completion) to me for my records and add calendar reminder on your schedule to ensure that the recurring trainings are done in a timely manner. Below is a table that outlines the training module and frequency required for members of our research group as of Summer 2022. This list may be updated in the future based on changes in research topics within the group.

Laboratory health and safety training courses.

Training type	One time or recurring	If recurring, frequency	Training format
Lab safety 101	Recurring	Every three years	Online
Right to Know	Recurring	Every year	Online
Shipping of dangerous goods	Recurring	Every two years	Online
Receiving hazardous material	Recurring	Every three years	Online
Using chemical inventory system	One time	N/A	Classroom or online
General biosafety	Recurring	Every three years	Classroom or online
Hazardous waste 101	One time	N/A	Online
Defensive driving	As needed, recurring	Every three years	Classroom or online.

Use this training tool to determine any additional trainings required and inform me of this, so they can be added to the above table: https://www.ehs.gatech.edu/training/tool.

Group members should not work in the laboratory alone. Make sure that when you are working in the laboratory that there is at least one person in the laboratory and both of you are aware of this. This is for safety purposes. If you have no recourse but to be in the laboratory alone at times, then you must inform at least one other group member that you will be in the laboratory alone and how long and that you may call them in case of any emergency or help.

4.2 Ordering supplies and Approvals.

Any ordering of supplies and instrumentation requires approval from me. You will need to create a requisition in workday with the items you need to order and send me an email and cc Mr. Michael Gooden (michael.gooden@ce.gatech.edu) asking for approval. Before sending email for approval the items in the requisition list should be added to the group purchasing worksheet. See **section 5.4** of the handbook on procedure for this. Get into the habit of sending the email immediately after creating a requisition in workday. The email should have the following details:

- Subject line: "[Ordering – RQ#] Requesting Approval" (RQ# is the workday requisition number)
- List of items being ordered, their purpose, and worktag on the items should be charged. If you are uncertain of the worktag for the order, ask me.

I will attempt to respond to your request ASAP. If I have not responded by the end of the day, send me a reminder email or slack message before the next business day. I do not expect you to discuss every purchase with me prior to requesting approval. However, if any item is more than $500 is being ordered for the first time, discuss with me so we can avoid a back and forth for clarification on the approval email. Once the items in your order arrive, please check them to make sure they arrived in good condition. You will then need to create a receipt for the order in workday to indicate which items have been received.

4.3 Budget Management Logistics.

Research expenses for research group members are allocated to project codes supporting their work. While the department maintains a record of expenditure, there can often be a time lag in communication if there is an over/under expenditure on projects since the department manages finances for many research groups. To get a better handle on expense and burn rate, we will pilot the following approach starting Summer 2022. At the start of each semester, each group member will be allocated a project code where they can charge their research expenses for that semester and a dollar amount (based on agreed upon research plans for the semester). Each group member will keep a track of their expenditure by using an excel spreadsheet provided in the "GT_resources" folder on Dropbox. Please maintain this on your local computer. If cumulative research expense exceeds the allocated amount for the semester, the group member can ask me for additional allocation of funds. At the end of each semester, the group member should report total expenses incurred over the semester for the project code(s) allocated to them. We have not used this approach in the past and we can revisit this as a group at the end of the first year of implementation to determine ways to improve it.

4.4 Managing Inventory and Instrumentation.

Inventory: Most inventory in the laboratory (instrumentation and supplies) are typically shared by multiple group members. Group members ordering a shared item (i.e., research consumable) should be aware of when the shipment arrives, should sign and date the shipment when it arrives with a sharpie, and enter this information (i.e., item type, catalog number, quantity, and arrival date) into a google doc inventory that is accessible to all group members. If the consumable is a chemical, then apply a chemical inventory barcode to it and include the barcode number in the google doc inventory. If a group member notices that we are running low on a consumable item,

check with the group (via slack) if anyone else will need it in the near term (within a month) and work with them to place a new order. Do not walk away after emptying a reagent bottle without follow-up ordering.

Instrumentation: Group members must be trained on the use of all instrumentation prior to using them. This training can be provided by a senior group member or by me. All expensive instrumentation (>$15K) will have an approved list of users (based on completion of training). All expensive instrumentation (>$15K) will have user log sheet associated with it and group members or external collaborators must log their use in a user log sheet. This is important to help with allocation of instrumentation maintenance costs across projects that these instrumentation support. All major instrumentation (>$15K) will have a group member assigned as the instrumentation manager. This group member is expected to review the user log monthly and keep up with scheduling service appointments. If an instrumentation breaks, then inform me and group member in charge and we can develop a plan to fix it. Also, leave a post-it with a "do not use" note on the instrumentation.

4.5 Publications and Authorship Policy.

Publications: As stated in section 2.2, there are specific expectations of the number of papers per group member. Our goal is to make sure our research is openly accessible and will strive to publish all manuscript open access. However, this may not always be possible based on how expensive the article processing charges (APCs) are for open access publication. As a workaround, it is expected that all publications will be deposited on the appropriate pre-print server (i.e., bioRxiv, engRxiv, medRxiv, etc.) prior to submission to a peer reviewed journal and will be updated throughout the revision process. This will allow the research to remain openly accessible even if the final peer reviewed manuscript is behind paywall. The lead author of the paper is responsible for making sure the pre-prints are updated.

Authorship policy: Our policy is that input of ideas, work, and time by group members on research that contributes to a manuscript merits co-authorship on that manuscript irrespective of career stage or role in the research group (e.g., undergraduate researchers should be considered for co-authorship if they helped perform experiments). The order of authorship typically is such that the first author of a manuscript will be the lead researcher on the paper. Sometimes, joint first authorship is also possible, and this should be discussed with me early in the process. Authorship and author order can sometimes be points of disagreements between collaborators and all group members are encouraged to address this early in the process of generating data for a paper.

4.6 Conference and Workshop Attendance Policy.

Conferences: Conferences are essential for disseminating your research, gaining recognition within our field and networking and thus critical for professional growth. Our group typically attends conferences within specific domains, and these are listed below along with their frequency. It is the responsibility of the group members who want to attend specific conferences to be on top of their abstract submission and early registration eadlines.

- IWA Microbial Ecology and Water Engineering (every two years)
- International Society of Microbial Ecology (every two years)

- Water Environment Federation Technical Exposition and Conference (annual)
- AWWA Water Quality Technology Conference (annual)
- IWA World Water Congress (every two years)
- IWA Leading Edge Technology Conference (every two years)
- ASM Microbe (Annual)
- American Chemical Society Conference (multiple times a year)
- Association of Environmental Engineering and Science Professors (every two years)
- Algal Biomass Organization Conference (every year)

Abstract submission: I will encourage you to submit abstracts for conferences. My expectation is that (1) you will discuss the conference of interest with me before preparing the abstract and why it is appropriate for you to submit and (2) you will share the first draft of the abstract with me at least 3-5 business days before the deadline. This will give me time to review and edit and enough time then to get feedback from other internal or external co-authors. No abstract should be submitted to a conference without the explicit approval of all listed authors and no authors should be excluded from an abstract as a matter of expediency or convenience (i.e., leaving authors off the abstract because there isn't time to incorporate or ask for their feedback).

Conference attendance policy: I will support conference attendance costs (i.e., travel, registration, accommodation, incidentals – see travel and reimbursement policy for details) for one-two conferences per year per group member if your abstract is accepted for an oral presentation (one international, two domestic). If your abstract is accepted for a poster presentation then (1) I would recommend that if a group member with oral presentation is attending the conference that they present your abstract – you will still be the first author on the poster, or (2) If the cost of attending such conference is less than $500 than I will provide funds for it. The School of Civil and Environmental Engineering and College of Engineering also provide matching travel funding for conferences and workshops. We maintain a list of these opportunities in the shared group Dropbox Folder titled "GT_resources". Please ensure to leverage these means of travel support as well.

Workshops: If you would like to attend a workshop that will benefit your research or professional development, discuss this with me with plenty of lead time. We can evaluate whether the timing of attending the workshop is appropriate for your career stage and if not, identify when it would be appropriate to attend. Some workshops usually also offer financial support for attendees, and these have early application deadlines. Thus, planning early is essential.

4.7 Travel and Reimbursement Procedures and Policy.

Spend authorization request: A travel spend authorization request must be submitted and fully approved on workday before any money is expended on associated travel. This authorization request typically takes 2-3 business days to get all levels of approval, so plan accordingly. This is particularly important as conferences have early registration discounts, so planning saves money. The "GT_resources" folder in the shared Dropbox folder has step by step process for applying for a spend authorization.

Cash advances: Unfortunately, I am unable to pay out of my pocket for any of your expenses and then get reimbursed for them (including conference accommodation and meals etc.) – not my rule. I also do not want you to be out of money until your reimbursement comes in. Thus, when applying for your spend authorization, ask for a cash advance. You can get an advance cash deposit for the entire amount you expect to spend at a conference and then either return excess money or apply for additional reimbursement if the amount spent was more than the cash advance requested. Take advantage of this and plan accordingly. The form to request cash advance is available in the "GT_resources" folder in the shared Dropbox folder. Please note that this option is not available for temporary researchers, visiting researchers, and undergraduate researchers.

Travel expense and reimbursement: When you pay for flights, registration, and accommodation make sure the last four digits of your credit/debit card appear on the receipt and it shows that amount is paid in entirety and the due amount is 0. This is required to get reimbursed. If the receipt does not show the last four digits of your credit/card statement, then you will need to provide a copy of your card statement showing the charge. In this case, make sure to redact all other expenses that may be personal expenses. Consider sharing hotel rooms where possible to save travel funds for future travels. I did this for most of my graduate and post-graduate school years and into early faculty years. Georgia Tech has a fixed per diem reimbursement cost for meals and incidentals based on destination of travel and I don't think you can get reimbursed for more than that on a daily basis. However, if you spend less than the per diem, request what you have spent and not the entire per diem amount.

4.7 Absences and Time-Off Policy.

All Georgia Tech employees are expected to report holidays/absences through workday. This policy would apply to any post-doctoral researchers in the research group. Graduate researchers are not expected to log time-off but are expected to follow the below group-specific policy. I do not keep a track or tally any individuals time off at the end of the year; we operate entirely on the honor system. Similarly, I do not have any expectations of researchers working from the lab/office five days a week; you should work where it makes most sense for you and where you are most productive. However, even if your work can be done entirely remotely at certain stages of your research, do maintain an office presence for the reasons outlined in the "Schedule" section of "Group Members roles and expectations" (Section 2.2.1).

Absences from work: If you expect to be away from the office/lab for more than two days (not including weekend or public holidays), do let me know in advance. If you plan on working remotely for an extended period or are taking longer holiday (> 2 days), discuss timing with me before finalizing your plans.

Time-off: Georgia Tech offers 13 official paid holidays (including Juneteenth which was made a federal holiday in 2022) every year and offers 15 vacation days per year. Below is the list of official paid holidays:

- New Year's Day (January) (n=1)
- Martin Luther King Jr. National Holiday (January) (n=1)

- Memorial Day (May) (n=1)
- Juneteenth (June) (n=1)
- Independence Day (July) (n=1)
- Labor Day (September) (n=1)
- Thanksgiving Break (November) (n=2)
- Winter Break (December) (five days starting Dec 25 and not including weekends.)

The vacation days and official paid holidays add up to 28 days off per year. You are not expected to work during the official paid holidays and in addition are expected to take the full 15 days off every year. There will be no regularly scheduled meetings on public holidays. Everyone needs time to unplug from work and recharge. Just make sure to take time off in accordance with GT paid holiday policy and above referenced absence from work policy for the group. Sometimes group members may prefer to take longer vacation (e.g., when travel to destination is expensive) and thus may opt not to take a paid official holiday and combine this with their travel plans or take a day off on a different holiday (e.g., for religious reasons). In this case, make sure to notify me in advance. Post-doctoral researchers are expected to follow policies outlined by Georgia Tech for leaves due to medical and/or family reasons. They can be found at this link. I am unable to locate an official medical/family leave policy for graduate students outlined by the graduate school; I don't think there an explicit policy. Considering this, the family and medical leave policy applicable to staff would also apply to graduate researchers. There may also be extenuating circumstances when longer time off from work is necessary; we can be work this out on a case-by-case basis.

5.0 CHECKLISTS

5.1 NEW TO THE RESEARCH GROUP CHECKLIST.

Things to do so you can settle into the group and GT smoothly

- Make sure you can sign into One USG Connect (https://oneusgconnect.usg.edu/).
- Get a GT ID and Buzzcard.
- Make sure you are on the payroll and HR has your information.
    - Contact person: Melisa Hubbs (melisa.hubbs@ce.gatech.edu)
- Get seating assigned in Ford EST Building.
    - Contact person: Michael Gooden (michael.gooden@ce.gatech.edu)
- Need a computer.
    - Configure a computer on GT preferred vendors
    - Check with me on configuration and cost and to get worktag for purchase
    - Contact IT for purchasing by creating a ticket by CE Intranet “IT Helpdesk” Link. https://intranet.ce.gatech.edu/node/1
- Get an external hard drive for data backup.
    - Check with me on configuration and cost and to get worktag for purchase
    - Contact IT for purchasing by creating a ticket by CE Intranet “IT Helpdesk” Link. https://intranet.ce.gatech.edu/node/1
- Get a user profile on the groups account on PACE Cluster.
    - Contact person: Ameet Pinto (ameet.pinto@ce.gatech.edu)
- Get keys to the laboratory and your office. You will need to provide a (refundable) cash deposit of $25 per key.
    - Contact person: Chaoyang Huang (chaoyang.huang@ce.gatech.edu)
- Sign up and complete all required health and safety training.
    - EHS website: https://www.ehs.gatech.edu/
    - Email proof of training completion to me.
- Ask to be added to the groups Slack Workspace
    - Contact person: Ameet Pinto (ameet.pinto@ce.gatech.edu)
- Ask to be added to the groups Google Sheet Semester Planner and Contact information list
    - Contact person: Ameet Pinto (ameet.pinto@ce.gatech.edu)
- Ask to be added to the groups Dropbox folder
    - Contact person: Ameet Pinto (ameet.pinto@ce.gatech.edu)

5.2 Leaving the Research Group Checklist.

- Return office and laboratory keys to Chaoyang Huang (chaoyang.huang@ce.gatech.edu) and get your key deposit back.
- Return laptop to me if it was purchased by GT. Check under your laptop for GT sticker if you are unsure.
- Return external hard drive to me.
- Return laboratory notebooks to me.
- Document where your samples, reagents, etc. are kept in the laboratory in an email with photos of locations and email me with "[Laboratory Inventory – YOUR NAME] subject line.
- If you need to maintain access to Groups Slack workspace, Dropbox folder, Google Sheet, and/or PACE cluster contact Ameet Pinto (ameet.pinto@ce.gatech.edu).
- Don't forget about us when you are famous.