UT Board of Trustees in March 2019 challenged the administration to come up with ideas to grow the UT research enterprise from ~$400M to $600 or $800M in the next five years!

Key recommendations:

1. Identify opportunities and eliminate barriers to success;
2. Diversify funding sources (agencies, private sector and foundations);
3. Recruit faculty in targeted growth areas;
4. Leverage and enlarge our unique partnership with ORNL.
Traditional Approach: Add Faculty

Research Funding ($ Millions)

- HIGHER PERFORMERS (Research Funding)
- LOWER PERFORMERS (Research Funding)
What is different at Georgia Tech & UC Berkeley?

2018 Total Research Expenditures (in Millions $)

Source: NSF 2018 R&D (HERD) Survey; IPEDS Data Center (Human Resources /
Impact of ORI Investment

2018 Total Research Expenditures (in Millions $)

2018 Tenure/Tenure Track Faculty

Source: NSF 2018 R&D (HERD) Survey; IPEDS Data Center (Human Resources / Faculty)
Mission
To strategically align the expertise and infrastructure of the University of Tennessee and Oak Ridge National Laboratory to usher in world-class interdisciplinary research and graduate education.

Vision
To become the coveted home for convergent research and talent development, helping maintain U.S. prominence as a global innovation leader and provide tangible impact to Tennessee.
Overarching Goals

1. Establish robust partnership platforms that promote industry engagement, entrepreneurship, and technology implementation for economic and community development;

2. Provide flexible mechanisms that promote discovery and innovation especially in, but not limited to, areas related to data science and technology, advanced materials, and outcomes-based applications;

3. Build on and expand existing joint programs to strategically integrate collaborative opportunities between UT and ORNL; and

4. Offer an enriched interdisciplinary educational and research experience for students.
Timeline for Rollout & Implementation

CONCEPT DEVELOPMENT
June - August 2019
- Establish ORI@UT by action of the UT Board of Trustees.
- Create mission and vision with UT and ORNL leadership.
- Appoint Steering Committee.

PROGRAM REVIEW & PLANNING
December 2019 - June 2020
- Assess Joint Programs.
- Create plan to maximize Joint Programs within the framework of ORI@UT.
- Appoint or recruit Director and initial management team.

STEERING PROCESS
September - December 2019
- Develop common understanding of Mission, Vision, and Objectives.
- Develop and prioritize work plan.
- Deliver recommendations of the Steering Committee to senior leadership.

GROWTH
July 2021 - July 2025
- Hire 60 new faculty/researchers, matched by 60 complementary hires at ORNL.
- Grow the collaborative graduate programs to 500 students.
- Attract large, interdisciplinary program funding.

LAUNCH
July 2020 - June 2021
- Conduct the initial ideation process.
- Appoint/recruit ORI Fellows.
- Begin recruitment of new faculty/researchers.
DOE-EERE
Workforce Development Project

Project Goal

Develop a national model for collaborative interdisciplinary research and workforce development from the technician to graduate level in areas that align with emerging fields related to the DOE-EERE mission.
Project Objectives

1. Expand and enhance the UT-ORNL Interdisciplinary R&D Program
   • Promote collaboration and team building that leads to innovative research in key EERE-emerging fields.

2. Develop a flexible workforce development program
   • Produce modular and flexible curriculum with students with diverse background to enable excellence in R&D, encourage entrepreneurship, and fosters rapid innovation.
Expected Outcomes

1. **New and enriched partnerships**
   - Expand the Joint Ph.D. Program Enrollment
   - Develop new modular curriculum options
   - Expand industry engagement
   - New partnerships with other universities and national labs

2. **Engage students where disciplines converge**
   - New team-science initiatives and research
   - New ideation and seed funding opportunities
   - Engage the community in efforts
   - Develop leadership skills and professional development
   - Increase the diversity of participants

3. **Build computational literacy**
   - Include DSE and leadership as foundational knowledge options for all ESE, DSE and GST students
   - Recruit two senior-level faculty hires
   - Develop community-based experiences and talent sharing programs

4. **Operate with transparency and accountability**
   - New framework to provide coordination and streamlining
   - Advisory board
   - Enhanced assessment and evaluation to promote faster course corrections
Complementary Research Themes

- Autonomous, Smart, Secure and Resilient Energy Systems
- Electrochemical Energy Systems
- Data Science
- Advanced Materials and Manufacturing
- Predictive Systems Biology
Seed Projects

• Open to all UT faculty and ORNL staff
• $150 – 200K awards (total costs) + up to three GRAs for one year.

Three seed projects have been selected:

1. A defense-in-depth approach for operable and safe connected vehicles;
2. Integrated Molecular-level Foundations for Advanced Manufacturing of Functional Macromolecules; and
3. AI-informed metrology for digital manufacturing.
Modular Coursework

First two modular courses will be offered in Spring 2021

**Biological Data Analytics**
- Data Visualization and Analysis
- Databases and Comparative Genomics
- Model fitting and stochastic modeling

**Data Science for Additive Manufacturing**
- Build devices
- Signal and Image Processing
- Machine Learning and AI

Future modular courses will promote a diverse range of topics

**Outreach**
- QIS for Automation and Industry 4.0
- Visualization for Scientific Outreach
- Data Science Tools for Humanities Students

**Policy**
- AI for biology based circular economy

**Leadership**
- Social Norms for Adaptation of New Manufacturing

**Entrepreneurship**
- Energy Storage and Entrepreneurship
Student Recruitment is a Top Priority

- Recruiting is a contact sport!
- ORI at UT will:
  - Take advantage of strong scientific relationships
  - Establish unique summer undergraduate experiences
  - Participate in university career fairs and professional organizations
  - Leverage existing programs i.e. McNair Scholars
  - Conduct monthly webinars and other targeted communications
Summer SMaRT Program

The Student Mentoring and Research Training (SMaRT) Program provides:

• 10-week immersive research experience for undergraduates
• Professional development
• Enhanced peer mentoring with UT graduate students
• Competitive stipend and housing
• Opportunities for recruitment and engagement
Developing top talent with transferable skills

- Conduct interdisciplinary team-based R&D
- Include strong industry engagement
- Embrace immersive experiences
- Embed leadership training
- Encourage entrepreneurship
- Explore the social impact
Sharing what we learn!

- **Goal**: develop a national model for collaborative interdisciplinary research and workforce development from the technician to graduate level in areas that align with emerging fields related to the DOE-EERE mission

- **National Learning Collaborative** will allow ORI at UT to engage other universities and national labs by sharing modules, best practices, and develop team science initiatives.
Challenges and Mitigation Efforts

Access to ORNL is restricted
Developed hybrid approach and limited access models to allow for students and joint faculty to continue research and shifted the focus to computational analyses of data & facilitating temporary access to UT resources.

Student recruitment is different
Refine and improve how we talk about what is different about the opportunity to study at ORI at UT with a focus on meaningful and impactful interdisciplinary research; efforts are broadly supported within UT and ORNL.

Student well-being is in sharper focus
Focusing on intentional engagement (e.g., weekly meeting, frequent one-on-one zoom meetings) and leveraging UT health resources.

State Budget impact
Reevaluated the budget model and began scaled back implementation. University and ORNL are advocating for additional support in 2021.

Noise
Presenting the overall vision and desired outcomes as broadly as possible.
Over and over again it has been demonstrated that the whole can be greater than the sum of its parts, that good people from diverse fields working together can make major scientific discoveries that are denied geniuses working in isolation.

Dr. Alvin Weinberg, ORNL Director from 1955 to 1973
Advisory Board
Purpose

Provide guidance to the Oak Ridge Institute at UT (ORI at UT) in fulfilling its mission to strategically align the expertise and infrastructure of the University of Tennessee (UT) and Oak Ridge National Laboratory (ORNL) to usher in world-class interdisciplinary research and graduate education. The Advisory Board has no legal or fiduciary responsibility for UT, ORNL, UT-Battelle or the Department of Energy (DOE).
Membership

- 10 – 15 members
- Broad representation of business, technical, academic, government, and economic development expertise.
- UT and ORNL will also have ex-officio members
- Term – up to three years
Meetings

• Three regular meetings per year
  • Two virtual meetings
  • One in-person meeting at UT or ORNL

• Member must attend at least two meetings per year to remain in good standing

• Special meetings will be held on an as needed basis upon recommendation of the Executive Director or Advisory Board
Compensation

- $3,000 paid at the end of each one-year term + reimbursement of related travel to approved Advisory Board meetings.
- UT, DOE or UT-Battelle employees are not eligible for compensation on this Advisory Board.
Advisory Board Objectives

1. To help guide the long-term strategic plan of the ORI at UT in accordance with its mission and the needs of the various stakeholders.

2. To assist the ORI at UT in identifying the most pressing science, business, community, and economic development opportunities.

3. To offer recommendations for program improvement.

4. To serve in an advisory role to the ORI at UT Executive Director and staff in identifying potential applied research projects and collaborations, suggesting ways to enhance the recruitment of students to the ORI at UT graduate and undergraduate program opportunities, and providing feedback on the asset mapping initiatives and collaboration tools.

5. To help promote the work and advocate for ORI at UT by helping to raise our profile and visibility.
Thank you!!