IPaT Spring Town Hall

January 30, 2020

IPaT Spring Town Hall

Learn about IPaT activities for Spring 2020

Jump start discussions on “Supporting Climate Resiliency”

Talk with your colleagues and discuss new ideas

email: ipat@gatech.edu

IPaT's Vision, Mission and Research Pillars

Shaping the future of human-centered systems, environments and technologies to promote satisfying, healthy and productive lives.

Catalyze *interdisciplinary research between faculty, students, and industry.*

Provide *the continuity and capacity to address societal challenges.*

Advocate *for socio-technical change that improves the human condition.*

Educate *human-centered engineers, scientists, designers, business leaders, and policy makers.*

Transdisciplinary Research Pillars

Lifelong Health and Wellbeing

Smart Cities and Inclusive Innovation

Platforms and Services for Socio-Technical Systems

Shaping the Human Technology Frontier

Lifelong Health and Wellbeing

New partnership with the Shriner's

Orthopedic Care

Joint program with Emory: Empowerment Program for Mild Cognitive Impairment

SimTigrate, Aware Home, Home Lab…

Seed grants

Critical Research Infrastructure

Pediatric Home Lab Underway

New CMS Medicaid Data

Collaborative Partnership with CDC

From pediatrics to aging, IPaT's continuum of healthcare research is working to promote and enable vibrant and lifelong physical and mental health.

Smart Cities and Inclusive Innovation

GA Smart Communities receive funding and support to envision, explore, and plan for their smart futures.

- First class: City of Albany, City of Chamblee, Chatham County, Gwinnett County + GT Researchers and Partners
- Second class: Columbus Consolidated Govt, Macon-Bibb County, City of Milton, City of Woodstock + GT Researchers and Partners
- *GA Smart Spring Workshop March 26*

New partnership with MARTA

National Workshop on the Future of Smart City **Digital Twin Technology**

Loukassis **Map Room** to "Restore Data's Sense of Place"

Developing innovative approaches to shaping resilient and sustainable communities through interdisciplinary collaboration in technology and policy.

Shaping the Human Technology Frontier

Wearable Fashion and Technology Panel event to be held in May 2020. Collaboration between WCC and Fashion Group International Atlanta.

Future of Sports Technology VIP section

Wireless RERC creating **new touch interfaces** incorporated into garment sleeve using passive and active haptic design elements.

Think Tanks

From #hashtags to Movements: Performance, Collective Narrative, and Erasure, a Black Feminist Perspective

Sports and eSports

Crafts as Research Medium

Language, Technology, and Society

Exploring new ideas in user experiences that foster creativity, stimulate learning and enable productive collaboration. Through this initiative, we're researching and developing novel wearable computing, assistive, augmented reality, and gaming technologies.

Platforms and Services for Socio-Technical Systems

Sea Level Tools for Emergency Planning & Response

Partnerships with City of Savannah, Chatham County, GDOT, Jenkins High School, etc

Smart Sea Level Sensors for Emergency Planning and Response, GA DNR Coastal Incentive Grant

ATT Climate Resiliency Challenge

NSF Mid-Scale RI-1 (M1:IP): FABRIC: Adaptive Programmable Research Infrastructure for Computer Science and Science Applications

NSF SCC-IRG Track 1: Building Coastal Community Resilience using Smart Environmental Sensors

Community Outreach and Engagement
(43+ sensors and counting)

Jenkins High School engineering program assembled 30 sensors last year and just delivered parts to assemble 30 more.

CEISMC partnership for middle school curriculum. Now available nationally at SECOORA webinar.

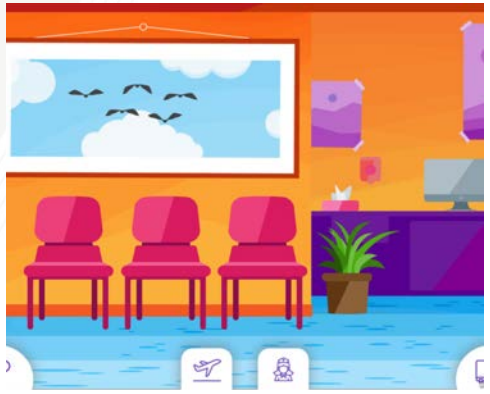
Working with west Savannah communities like Hudson Hill on Neighborhood Disaster Plan

Merging physical and digital worlds with complex data analytic and communication capabilities. We are building new network infrastructure technologies with the goal of creating connected systems that support communities.

IPaT • GTRI


MAY THE FOURTH BE WITH YOU


Exam Room




PASSPORT JOURNEY


Click Safe
A new emergency response app to aid case managers in exiting threatening and dangerous site situations.
• Quick and discreet.
• Activated within moments.
• Press and hold five seconds or press five consecutive clicks.
• Alerts both manager and emergency contact center.
• Pinpoints case manager location for safe removal.
Launches December 2018 in select Georgia counties.


00:00:23

IPaT Values

One GT

We will operate collaboratively by sharing knowledge and resources, all for the greater good of Georgia Tech.

Innovation

We will support a culture of creativity, thought leadership and boundary-pushing ideas, and be unafraid of failure.

Trusted Partner

We will be transparent, meet deadlines, and work together to enhance and grow valuable relationships on and off campus.

Diversity

We will recognize, respect, and embrace inclusion and fairness throughout all aspects of our research, practice and operations.

Translating Mission to Action

Catalyze *interdisciplinary research between faculty, students, and industry.*

Provide *the continuity and capacity to address societal challenges.*

Advocate *for socio-technical change that improves the human condition.*

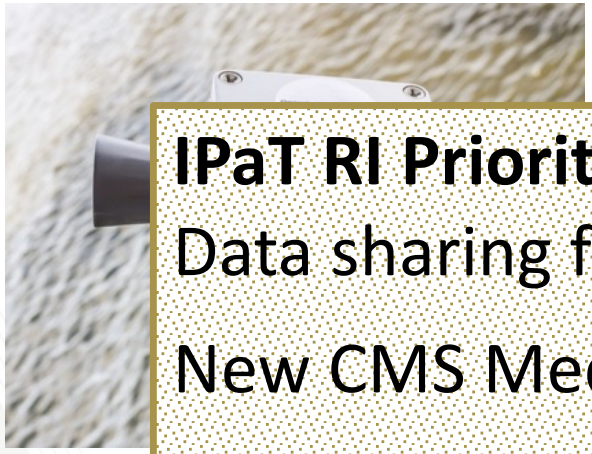
Educate *human-centered engineers, scientists, designers, business leaders, and policy makers.*

General IPaT Support Mechanisms
Annual People and Technology Forum
Annual Seed Grants Faculty recruiting; Start-up support
Annual “IPaT Office Hours”
Town Hall meetings, Faculty Retreats, Research Showcases
Convergence Innovation Competition (Fall and Spring)
Faculty-led Symposiums; Industry Roundtables
Thursday Think Tanks
Current and Prospective Industry Partnerships
Proposal Support; Research Communications Support; Event Support….
Research Infrastructure and Lab Support

Examples of IPaT Research Infrastructure

The **Georgia Tech Aware Home** is an interdisciplinary research endeavor involving faculty and student researchers from multiple domains across campus.

Aware Home researchers are interested in Health and Well-being, Digital Media and Entertainment, and Sustainability, investigating how new technologies can impact the lives of people at home.



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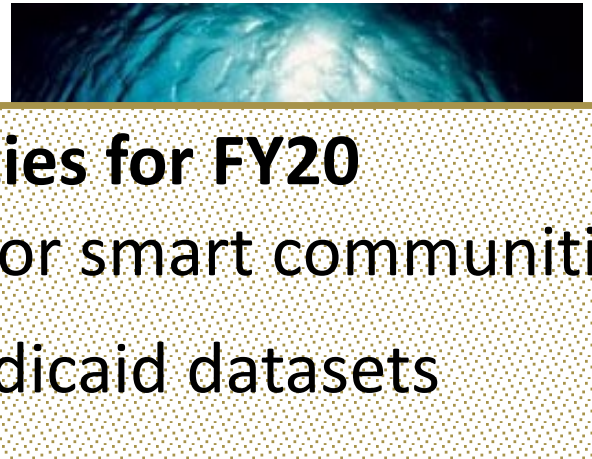

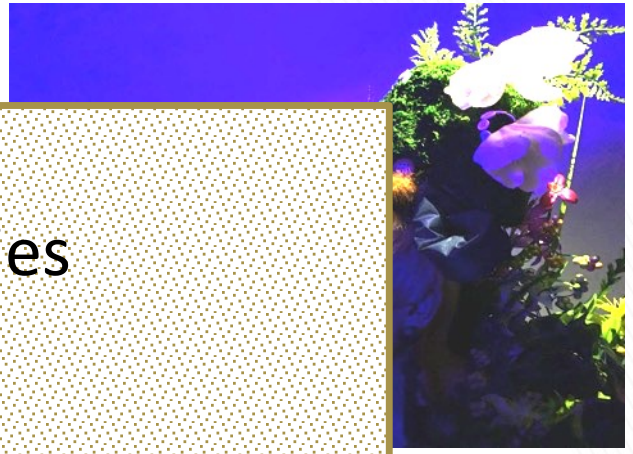

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IPaT RI Priorities for FY20

Data sharing for smart communities

New CMS Medicaid datasets

Hi Trust Interim Assessment

Facilities directory for IPaT

Aware Home, SimTigrate and HomeLab to support MCI / aging research programs

Also Pediatric HomeLab

IPaT Think Tanks

2020 Trend Report	January 16
Advancing Atlanta as a World Leader in Sports Research, Innovation and Technology	January 23
Crafts as a Domain for Research	February 6
Working With Health Care Data	February 13
Future of Language Research	February 20
Your Ideas Here	February 27 - March 26

Thursdays, 3:30-5 p.m. IPaT@Centergy

email: ipat@gatech.edu

Convergence Innovation Competition (CIC)

Final Judging Wednesday, April 1

Bi-Annual Competition: Student project teams develop and present viable working prototypes

12 years running
>250 students/year
Students from diverse majors and schools

Fall and Spring Semesters
Atlanta and (often) GT Lorraine

Categories (Spring 2020)

- Climate Solutions
- Health on the Move
- Create and Perform

Sponsor: Verizon

Partners: Global Change Program, CREATE-X, GT Athletic Association

cic.gatech.edu

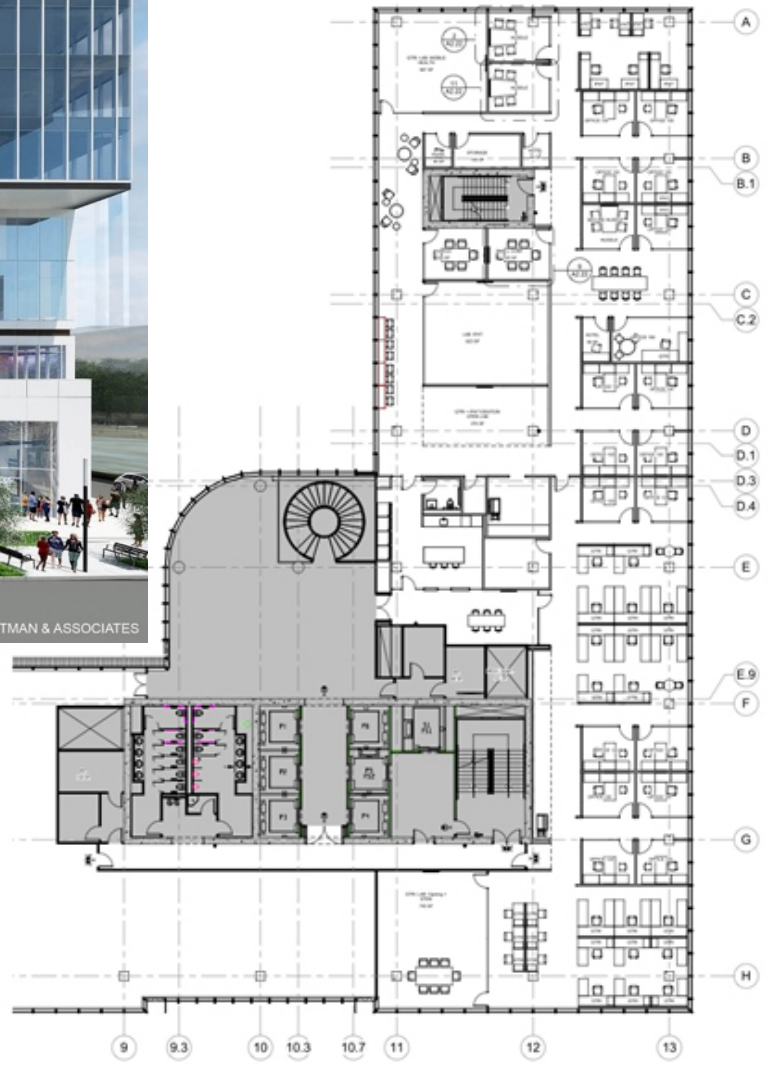
Benefits Include:
Prizes, Exposure, Contacts, Real World Feedback
IP Retained

Think your idea doesn't fit?
Ask us—categories are intended to shape, not exclude.

IPaT Space … the final frontier

IPaT@Centergy

- Collab hub
- Staff hub



IPaT@Coda

- Health data / apps
- Ideation lab

IPaT@TSRB

- Student app lab (shared with GVU and HCI MS)
- RNOC labs lending library
- Interactive Media labs and installations

IPaT Spring Schedule

IPaT Spring Town Hall **Jan 30, 2020**

Thursday Think Tanks **Thursdays, 3:30-5pm**
Jan 16, 23; Feb 6-27; March 5, 12, 26

IPaT Research Directors
February 19, March 25, April 15; 8:30-10am

Convergence Innovation Competition (CIC) **April 1, 2020**

2020 Sports Symposium & Esports Invitational **April 3, 2020**

GVU Research Showcase **April 15, 2020**

Georgia Tech
CREATING THE NEXT

IPaT Capabilities and Support for the GT Research Communities

Professional Staff

- Research Operations (Matt Sanders)
- Business Operations (Cynthia Moore)
- Research Communications (Alyson Powell Key)
- Industry Partnerships (Siva Jayaraman)
- Grants and Finance (Francine Lyken)
- Think Tanks and CIC (Faith Sumpter)
- Space and Events (Don Schoner)

Applied Research and Faculty Engagement

- Leigh McCook, Deputy Director (GTRI)
- Russ Clark, Maribeth Gandy and Debra Lam, Managing Directors

Minute Madness

Minute Madness

Siva Jayaraman

SPRINT and GEAR

Sports Research Innovation & Technology (SPRINT)

IPaT
Institute for People and Technology

GT Athletics
BME
ECE
ATDC
OIC
GTRI
ME

Faculty Engagement

Seed Grant Program
Workshops
Knowledge Transfer

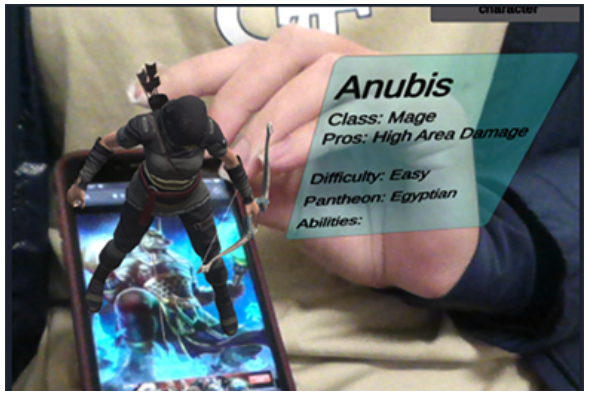
Student Engagement

GT Sports Hackathon
GT CIC
GT Sports Symposium

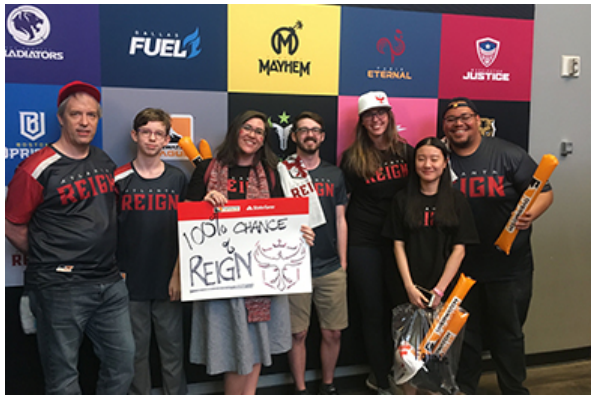
Leadership

Travel
Marketing
GT Sports Symposium

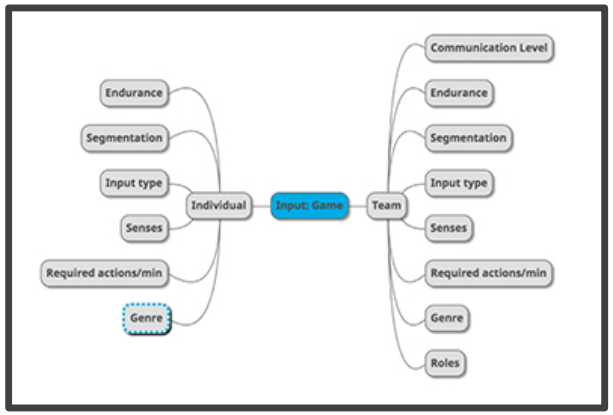
Gaming and Esports Applied Research (GEAR)



User Support Technologies



STEM Engagement



Player Health and Support

Supporting Partners
Atlanta Reign
Hi-Rez Studios
Skillshot Media

http://ipat.gatech.edu/gear
Laura Levy – Research Director
laura@imtc.gatech.edu

Inaugural Sports Symposium & Esports Invitational (Apr 3)

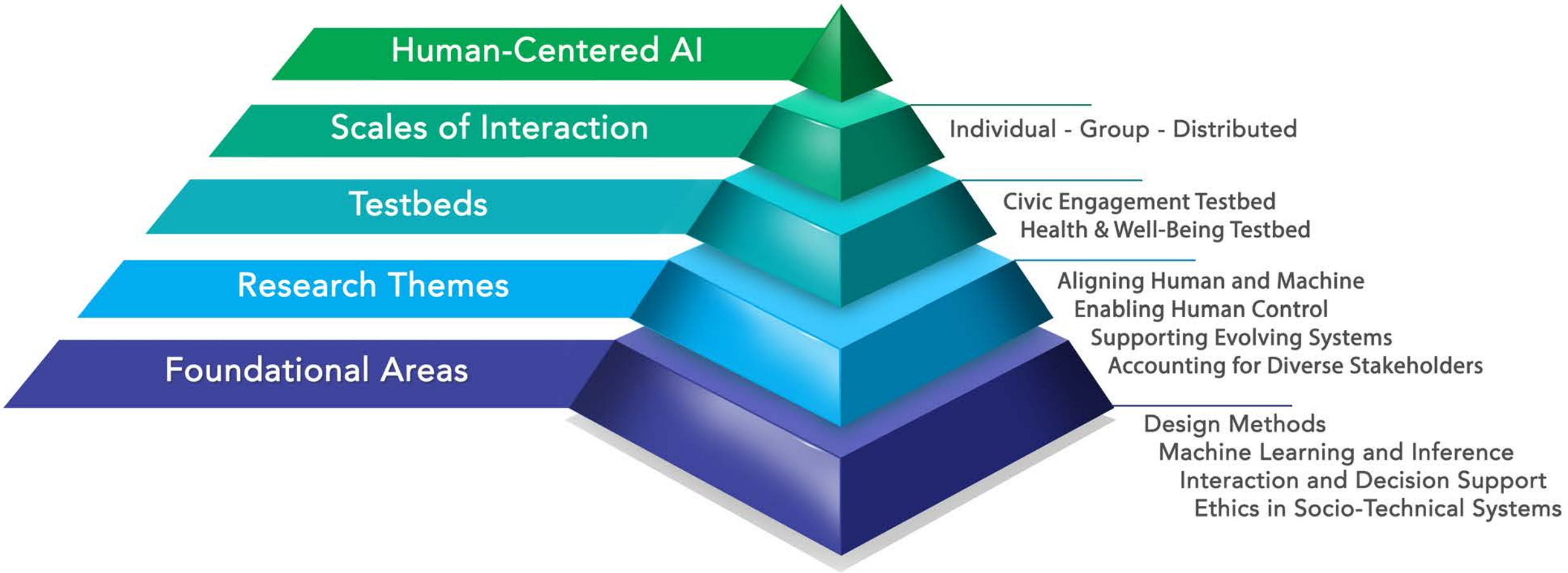
- Coda Building
- Sponsorship Opportunities – Siva Jayaraman jsiva@gatech.edu

Minute Madness

Beth Mynatt

Human-Centered AI

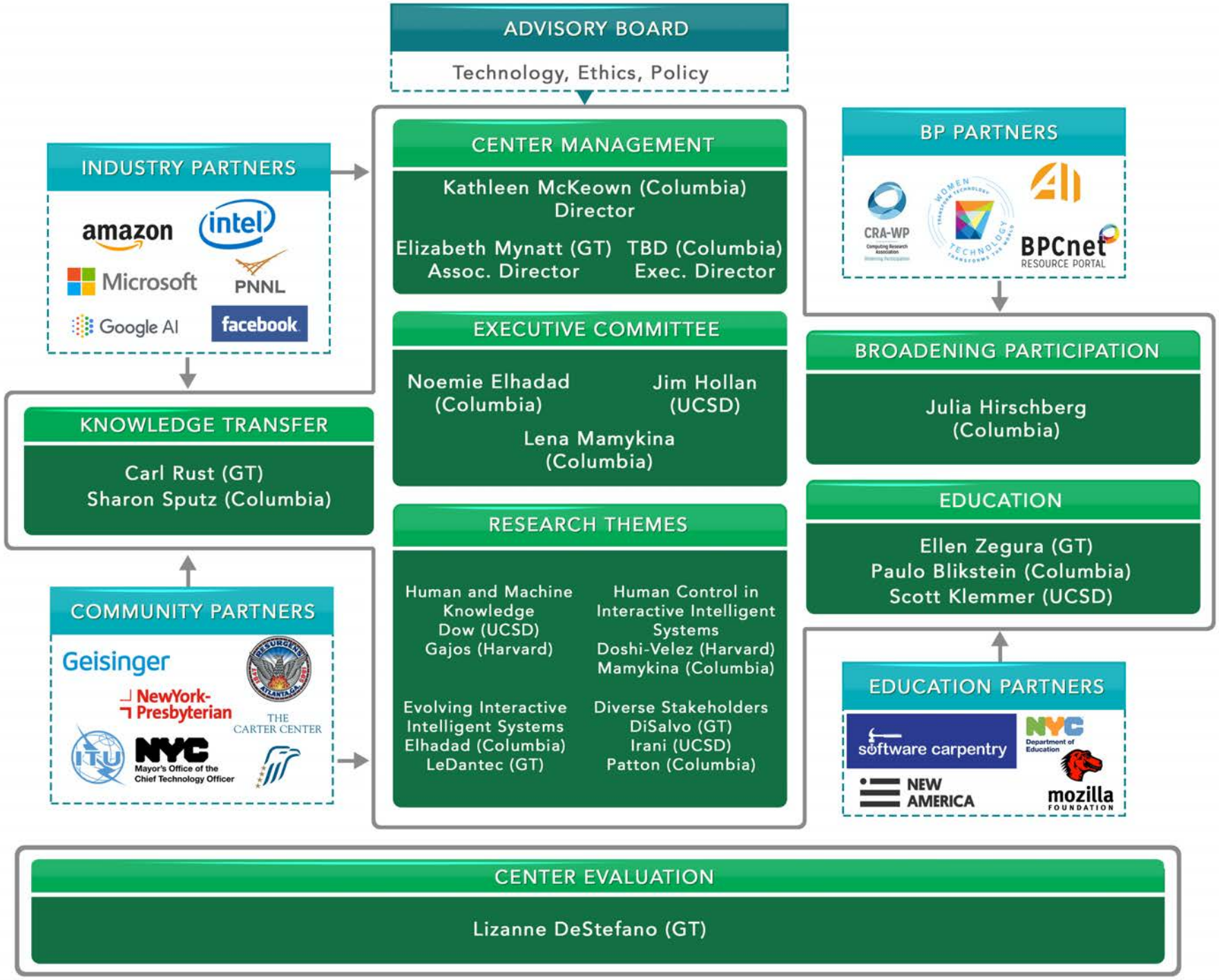
NSF Science and Technology Center Proposal for Human-Centered AI



NSF STC Proposal

Human-Centered AI

Submitted 1/27/2020



NSF STC in Human-Centered AI

Next Steps

- Planning for a symposium in late spring early summer
- If successful, notification in June; site visits in Fall 2020

GT Faculty

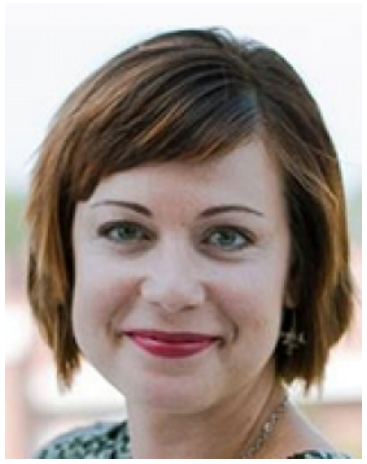
- Associate Director: Mynatt
- Research Theme Leads: DiSalvo (Carl), Le Dantec,
- Education: Zegura
- Evaluation: DeStefano
- Industry: Rust
- Research: Best, Biddle, Endert, Essa, Goel, Parker, Ploetz, Starner
- Also Akintobi (Morehouse) and GT alums

Panel: Supporting Climate Resiliency

Panel: Supporting Climate Resiliency

Marilyn Brown
Professor
School of Public Policy

Kim Cobb *(moderator)*
Professor
School of Earth and Atmospheric Sciences



Jennifer Leavey
Prin. Academic Professional
School of Biological Sciences

Jessica Rose
Assoc. Director
Analytics and Communications
Facilities Management

Rich Simmons
Sr. Research Engineer and Fellow
Strategic Energy Institute

Georgia Drawdown™





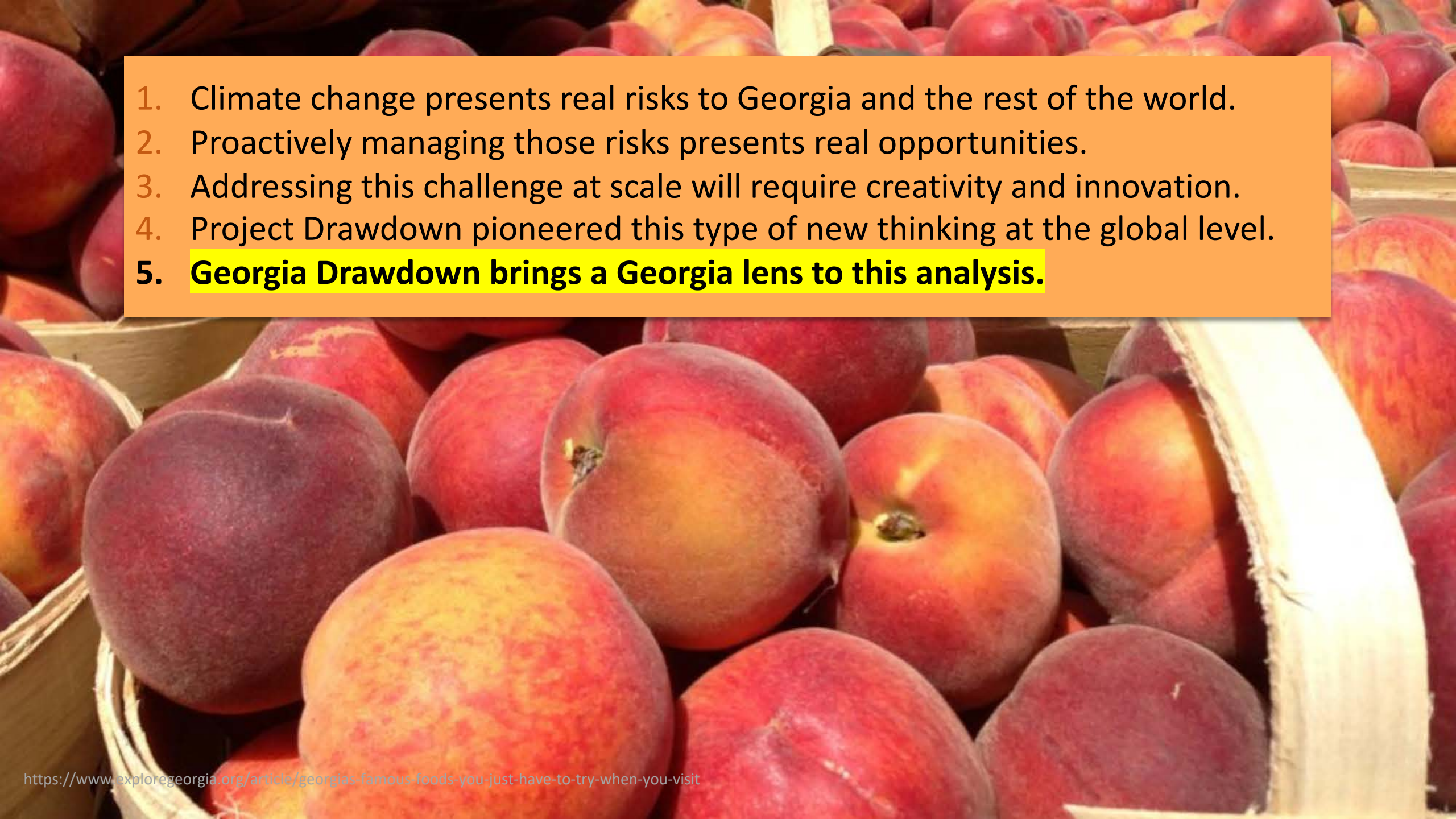
Georgia Drawdown and Climate Resiliency at the Intersection of People and Technology

Dr. Marilyn A. Brown (mbrown9@gatech.edu)
Regents' & Brook Byers Professor of Sustainable Systems

IPaT Spring Town Hall

January 30, 2020

Georgia Tech · University of Georgia · Emory University · the Ray C. Anderson Foundation

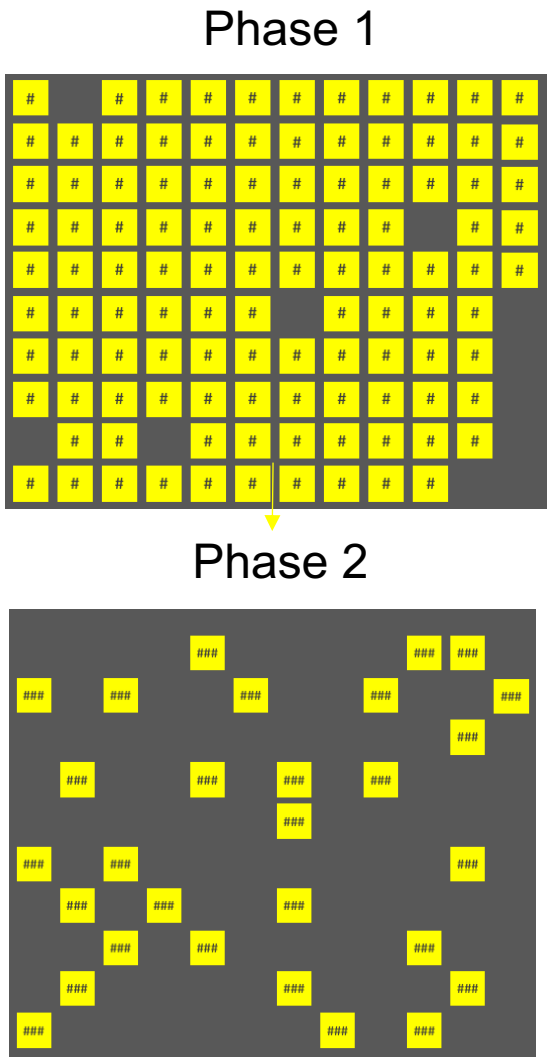


1. Climate change presents real risks to Georgia and the rest of the world.
2. Proactively managing those risks presents real opportunities.
3. Addressing this challenge at scale will require creativity and innovation.
4. Project Drawdown pioneered this type of new thinking at the global level.
5. **Georgia Drawdown brings a Georgia lens to this analysis.**

https://www.exploregeorgia.org/article/georgias-famous-foods-you-just-have-to-try-when-you-visit

Down-Select Criteria: reflects concepts of technology diffusion, supply chains, learning curves,…

1. **Is the solution technology & market ready for Georgia?**
2. **Is there sufficient local experience and available data?**
3. **Can the solution reduce 1MTCO$_2$e annually by 2030?**
4. **Is the solution cost-competitiveness?**



How ambitious should our targets be? What is "achievable" potential?

Visualizing ways to reduce 1 $MtCO_2e$ in Georgia in 2030

- 4 new parabolic trough concentrated solar power (CSP) plants
- 10 new power plants, each @ 50 MW, burning biomass waste*
- 24 new solar farms, each @ 50 MW*
- 216 typically sized methane digester projects
- 1,227 local geothermal energy projects like Roosevelt Warm Springs
- 156,000 new home solar systems @ 5 KW*
- 215,000 micro wind turbines
- 294,000 in-stream hydro generators (1,000 per mile in the Savannah River)
- 1.4 million households participate in a demand response activity*
- 7.1 million homes (70% of GA's households) use solar water heating



Georgia Drawdown's Short List of 23 Solutions focusing on 2030: barriers, accelerators, willingness to pay, how to design solutions that can gain traction, ….

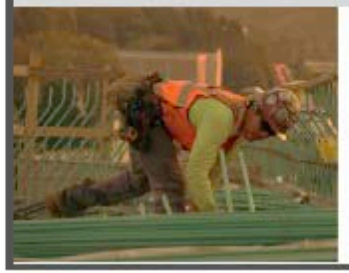
ELECTRICITY GENERATION

- Solar Farms & Community Solar
- Rooftop Solar
- Cogeneration
- Demand Response
- Biomass Power

TRANSPORTATION

- Energy-Efficient Cars
- Energy-Efficient Trucks
- Mass Transit
- Aviation Groundworks
- Electric Vehicles

BUILT ENVIRONMENT & MATERIALS

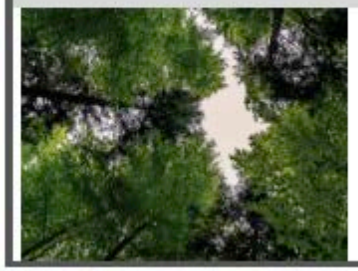


- Refrigerant Management
- Landfill Methane
- Alternative Mobility
- Waste Management
- Retrofitting

FOOD SYSTEMS

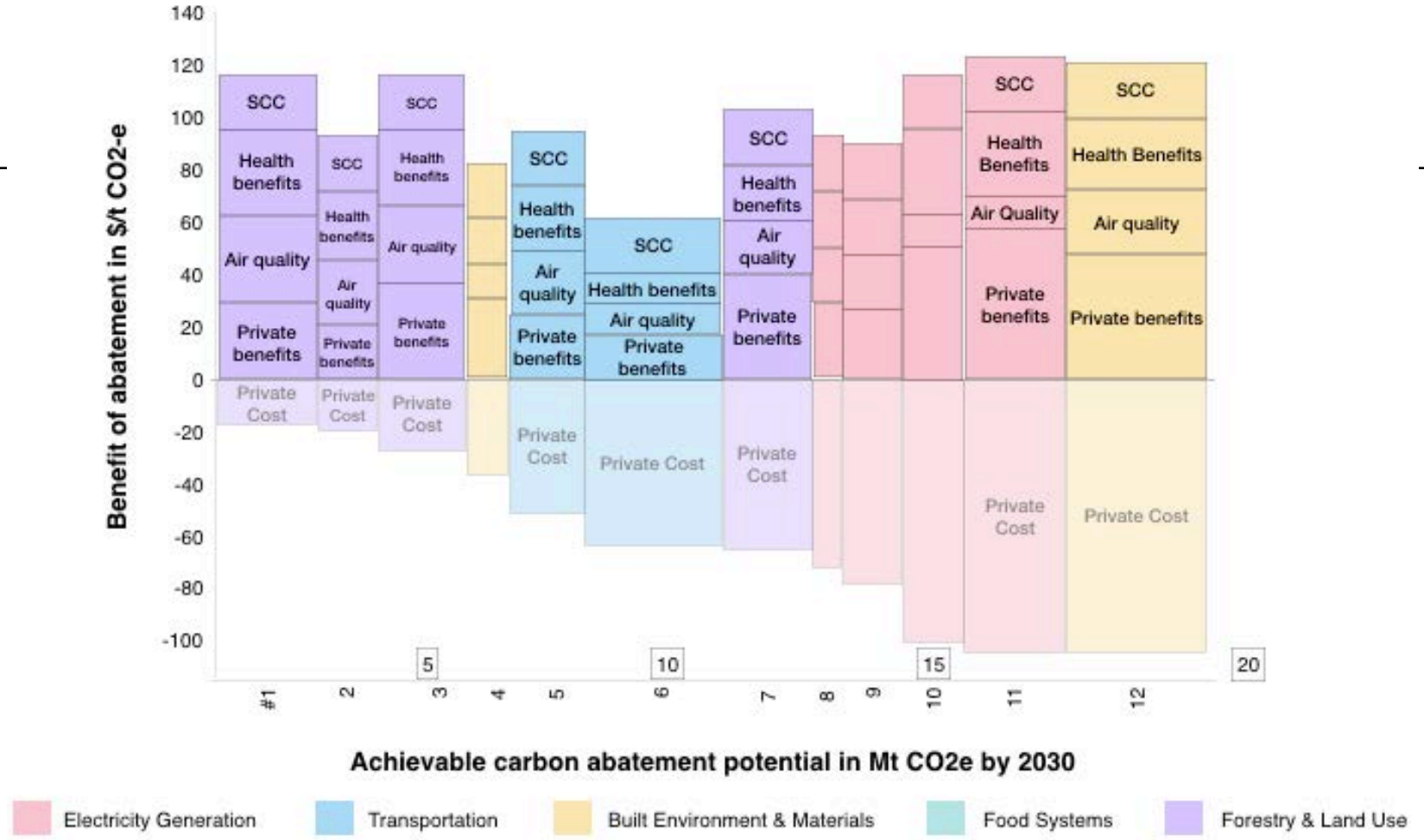
- Reduced Food Waste
- Plant-Rich Diet
- Conservation Agriculture
- Composting

FORESTRY & LAND USE



- Temperate Forests
- Forest Protection
- Afforestation & Silvopasture
- Coastal Wetlands

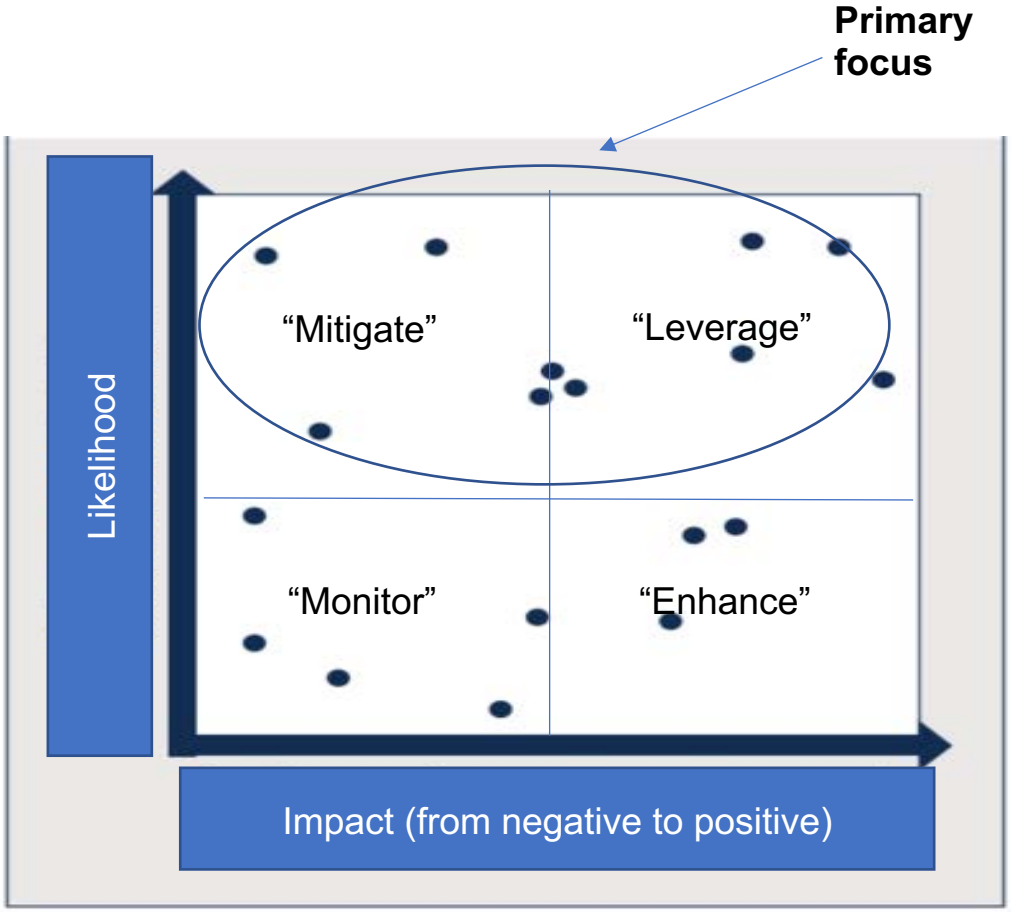
The Georgia Drawdown Curve will address solution interactions, the logic of plausible policies, understanding innovators, opinion leaders, stakeholders,…



Engagement Opportunities

“Beyond Carbon” are being Considered of all 23 Solutions

- Based on peer-reviewed literature and survey
- Rank the issues according to likelihood & impact (positive & negative)
- Conduct survey among experts and stakeholders to a) validate issues & prioritization b) prompt for relevant studies or data support) c) solicit suggestions on “mitigate” vs “leverage” approaches
- Estimate jobs, air quality, equity impacts for as many solutions as we can

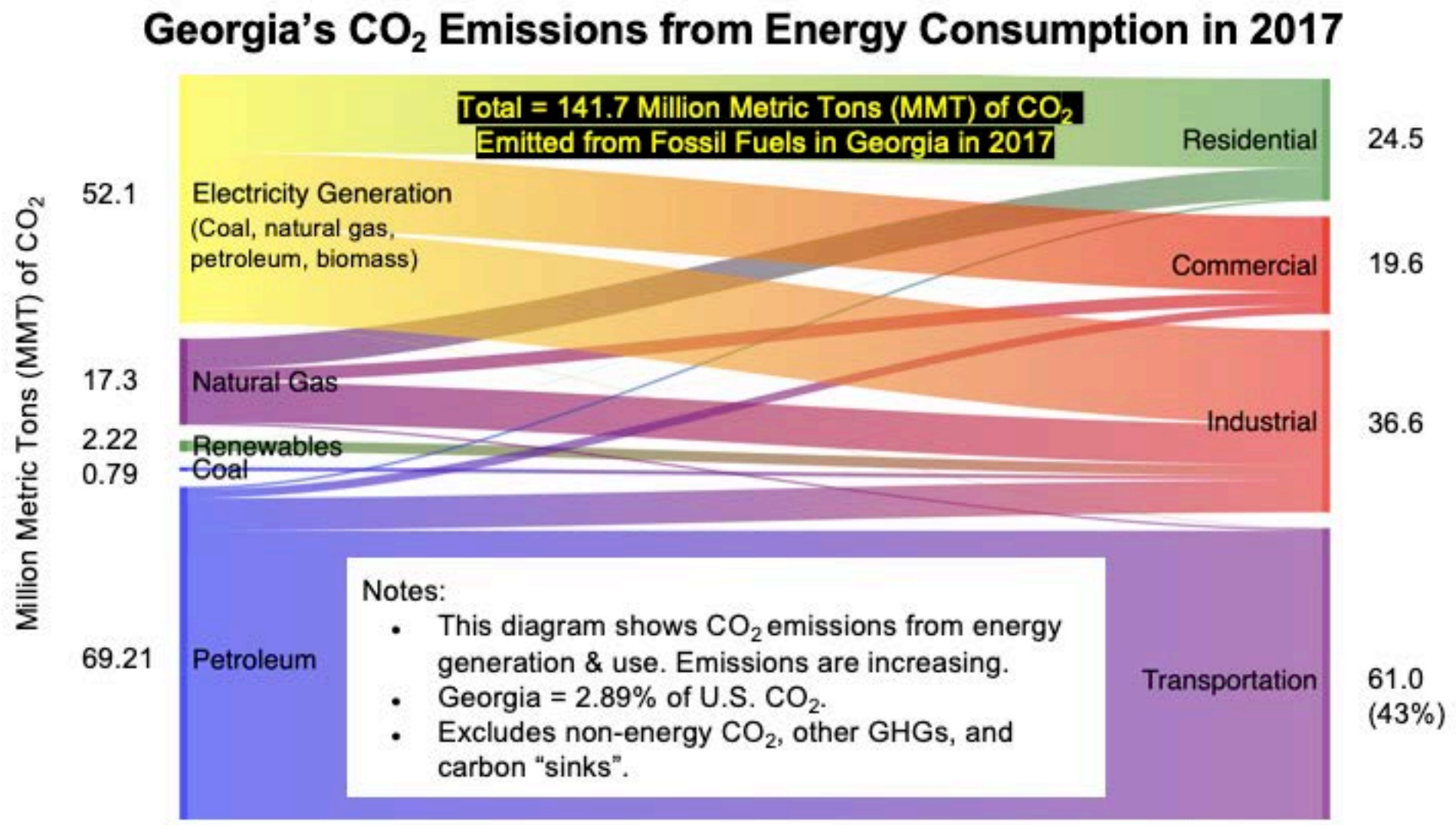


Extras

		Environment					Equity					Economic Development & Jobs						Public Health				
		Air Quality	Water Quality & Quantity	Land Use	Ecosystem/ Biodiversity	Material Disposability	Affordability	Distribution Economic Development	Public Health Impacts	Accessibility of Solutions	Cultural Fit & Way of Life	Local Economy & Employment	Input Prices	Workforce Composition	Wages and Benefits	Property Values/Tax	Infrastr. Requirments	Premature Mortality	Morbidity	Quality of Life	Education	Public Safety
Electricity Generation	Wind Turbines (Onshore)																					
	Solar Farms																					
	Rooftop Solar																					
	Cogeneration																					
	Microgrids																					
Transportation	Electric Vehicles																					
	Mass Transit																					
	Trucks																					
	Airplanes																					
	Cars (Hybrids)																					
Built Environment	Refrigerant Management																					
	Waste Management																					
	Retrofitting																					
	Landfill Methane																					
	Alternate Mobility																					
Food	Reduced Food Waste																					
	Plant Rich Diet																					
	Regenerative Agriculture																					
	Conservation Agriculture																					
	Nutrient Management																					
Land Use	Silvopasture																					
	Tree Intercropping																					
	Forest Preservation																					
	Afforestation																					
	Temperate Forests																					

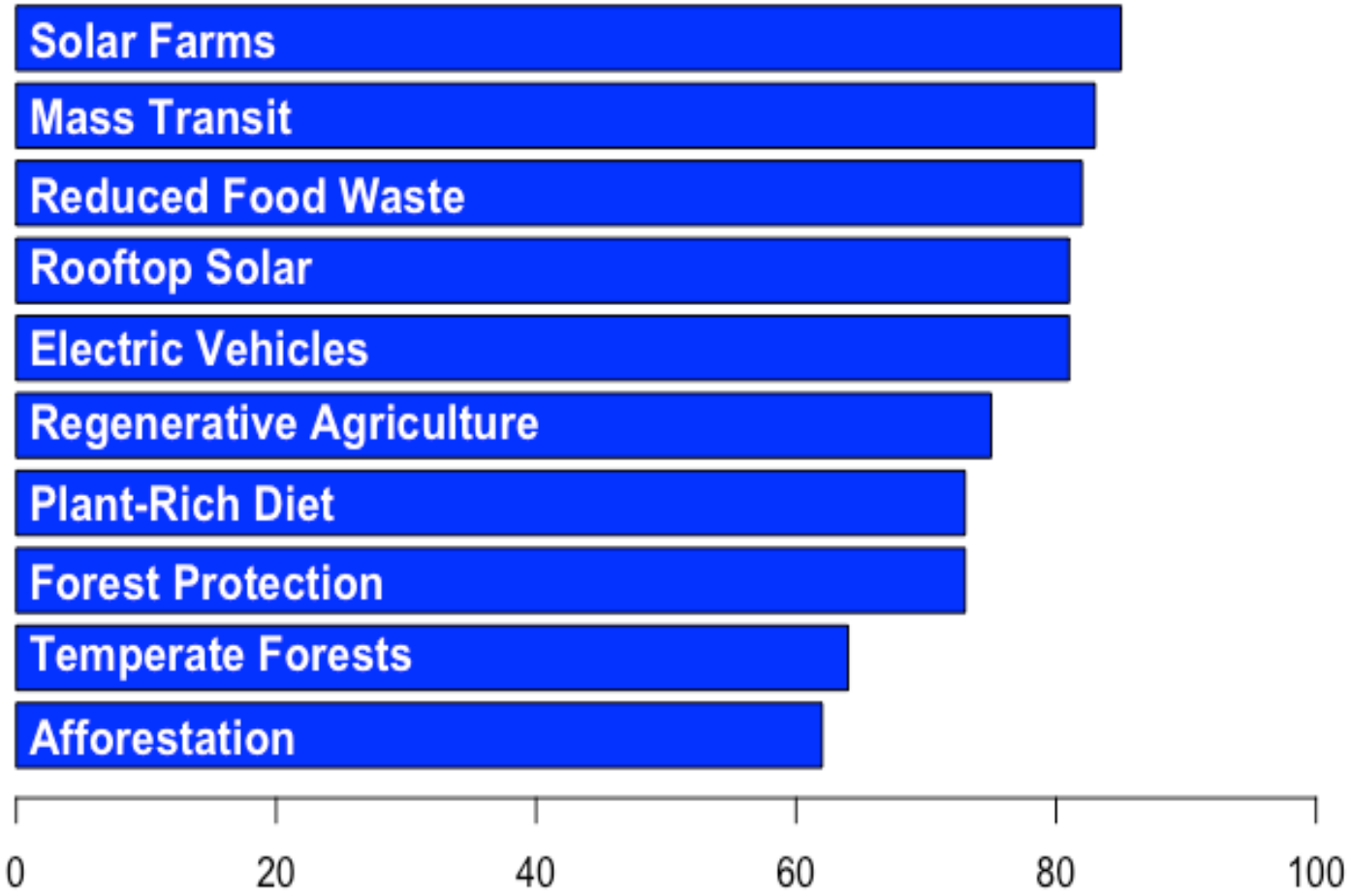
Legend: **Green Bold: Positive;** Orange Underline: Potentially Adverse; *Red Italics: Adverse*

Initial Work | Georgia's Current Carbon Footprint ~ 100 Million Metric Tons



Conversion factors: Page 3 https://www.epa.gov/sites/production/files/2019-04/documents/2019_fast_facts_508_0.pdf

Expert and Crowdsource Surveys: Rate solutions and identify missing solutions



Georgia Tech Urban Honey Bee Project

Jennifer Kraft Leavey – bees.gatech.edu

IPaT Star Award

IPaT Star Award

Smart Sea Level Sensor Team

Project Leads

Russ Clark

Kim Cobb

IPaT Contributors

Scott Gilliland

Fariba Hollister

Jeremy Johnson

Peter Presti

Matt Sanders

IPaT Star Award

IPaT Staff Members

Shawn Imtiazuddin

Systems Support Engineer

IPaT Star Award

IPaT Staff Members

Raul Perez

Graphic Designer