



AGENDA

IALR Board of Trustees APPLIED RESEARCH COMMITTEE

Tuesday, January 30, 2024 - 9:00–10:30 am – IALR Conference Room 203

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| I. Convening of Meeting | Dr. Guru Ghosh |
| A. Welcome | |
| B. Call to Order and Confirmation of Quorum | |
| C. Call for Changes to Agenda | |
| II. Attendance of Committee Member(s) by Electronic Communication Means (Vote Required) | Dr. Guru Ghosh |
| III. Approval of Minutes | Dr. Guru Ghosh |
| A. August 1, 2023 | |
| B. October 31, 2023 | |
| IV. Research Report | Dr. Scott Lowman |
| V. Open Discussion of Concerns, Issues, and Observations | Group |
| VI. Adjournment | Dr. Guru Ghosh |

Reference material included: “Research-Related Updates”

Future Committee Meetings

April 30, 2024

Applied Research Committee Members

Dr. Guru Ghosh, *Chair*
Ms. Emma Kozlowski
Mr. Charles Majors
Ms. Leslie Mantiply
Mr. Don Merricks, *Ex Officio*
Mr. Kunal Patel

Future Plenary/BOT Meetings

February 15, 2024
May 16, 2024

IALR Staff

Mr. Telly Tucker, President
Dr. John Hughes, Executive Vice President, Operations
Dr. Scott Lowman, Director of Applied Research
Ms. Pam Patterson, BOT Secretary & Executive Assistant



**IALR BOARD OF TRUSTEES (BOT)
APPLIED RESEARCH COMMITTEE**

Minutes - August 1, 2023 – 9:00 a.m. – IALR Conference Room 203 – In-Person

<p><u>Members Present</u> Dr. Guru Ghosh, <i>Chair</i> Ms. Emma Kozlowski, <i>via Zoom</i> Mr. Charles Majors Ms. Leslie Mantiply Mr. Don Merricks, <i>Ex Officio</i> Mr. Kunal Patel</p> <p><u>Members unable to attend</u> None</p>	<p><u>IALR Staff Present</u> Mr. Telly Tucker, President, IALR Mr. John Hughes, EVP, Operations Dr. Scott Lowman, Vice President of Applied Research Ms. Pam Patterson, BOT Secretary & Executive Assistant</p> <p><u>IALR Staff unable to attend</u> None</p> <p><u>Guests</u> None</p>
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Call to Order / Quorum / Changes to Agenda

Dr. Guru Ghosh called the meeting to order at 9:10 a.m. on Tuesday, August 1, 2023. A quorum was present. There were no changes to the agenda.

Attendance of Committee Member(s) by Electronic Communication Means

Dr. Guru Ghosh announced that Ms. Emma Kozlowski would be participating through electronic communication means (via Zoom) due to the distance between her principal residence and the meeting location. The committee voted to allow her to attend the meeting via Zoom.

- **Motion:** Mr. Charles Majors made a motion to allow Ms. Kozlowski to attend the meeting via Zoom. Ms. Leslie Mantiply seconded the motion. The motion passed unanimously.

The results of the vote are shown below.

Committee Members Absent	-	0
Committee Votes For	-	5
Committee Votes Against	-	0
Committee Abstentions	-	0

Approval of Minutes

- **Motion** – Ms. Leslie Mantipty made a motion to accept the Minutes for the May 2, 2023, meeting. Mr. Charles Majors seconded the motion. The motion passed unanimously.

Research and Business Development Update

Dr. Scott Lowman presented the Applied Research Report (**Exhibit A**) and the PowerPoint presentation titled, *Applied Research Committee Meeting Highlights* (**Exhibit B**). The presentation included updates on work within the department and how it aligns with the IALR Strategic Plan. Current activities included:

- Research collaborations, partnerships, and meetings
- AgTech and Life Sciences Manufacturing Support - to grow industries through testing, contract research, and lab access
- Grants/Funding
- CEA Economic Development
- Summer Interns (7)

Open Forum of Concerns, Issues, and Observations

No concerns, issues, or observations were discussed.

Adjournment

Dr. Guru Ghosh asked for a motion to adjourn the meeting.

- **Motion:** Mr. Charles Majors made a motion to adjourn the meeting. Mr. Kunal Patel seconded the motion. The motion passed unanimously, and the meeting was adjourned at 10:20 a.m.

Minutes Recorded By:

Minutes Approved By:

Ms. Pam Patterson
BOT Secretary

Dr. Guru Ghosh
Chair

Date

Date

Attachments Included as Official Part of Minutes

Exhibit A – Applied Research Narrative Report, July 2023

Exhibit B - Applied Research PowerPoint Presentation, August 2023

DRAFT



**IALR BOARD OF TRUSTEES (BOT)
APPLIED RESEARCH COMMITTEE**

Minutes – October 31, 2023 – 9:00 a.m. – IALR Conference Room 202 – In-Person

<p><u>Members Present</u> Mr. Charles Majors Mr. Kunal Patel</p> <p><u>Members unable to attend</u> Dr. Guru Ghosh, <i>Chair</i> Ms. Emma Kozlowski Mr. Don Merricks, <i>Ex Officio</i> Ms. Leslie Mantiply</p>	<p><u>IALR Staff Present</u> Mr. Telly Tucker, President, IALR Dr. John Hughes, EVP, Operations Dr. Scott Lowman, Vice President of Applied Research Ms. Pam Patterson, BOT Secretary & Executive Assistant</p> <p><u>IALR Staff unable to attend</u> None</p> <p><u>Guests</u> None</p>
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Call to Order / Quorum / Changes to Agenda

Mr. Telly Tucker called the meeting to order at 9:00 a.m. on Tuesday, October 31, 2023. A quorum was not present. There were no changes to the agenda.

Attendance of Committee Member(s) by Electronic Communication Means

There were no attendees via electronic communication.

Approval of Minutes

Due to the lack of a quorum, approval of the minutes for the August 1, 2023, meeting was tabled until the next meeting.

Research and Business Development Update

Dr. Dr. Scott Lowman presented the Applied Research Report (Exhibit A). The report included updates for collaborations, partnerships, grant funding, CEA activity, and other items of support. Current activities included:

- Grants/Funding:
 - Received two Tobacco Region Revitalization Commission (TRRC) grants totaling \$500,293
 - Received a USDA grant totaling \$54,000
 - Received \$110,00 from Agrospheres to fund a new employee for two years

- Grant Submittals:
 - USDA grant with the University of Arkansas - \$685,732
 - Small Business Innovation Research – teamed with a start-up company located in Richmond, VA focused on AgTech in Hydroponics to support three submittals
 - Teamed with the University of Georgia on a grant titled “The Use of Bacterial Endophytes to Improve Hydroponic Vegetable Production” - \$306,459

- Tours Provided:
 - Applied Research and the Virginia Tech / IALR Controlled Environment Agriculture Innovation Center hosted a group of 50 students from the Pittsylvania County STEM Academy
 - Hosted Mr. Bryan David, Program Director, Southern Virginia/GO Virginia Region 3, and his team for a tour of the labs and CEA center to highlight the various ways companies are supported.
 - Mr. Brian Dail, Managing Director of Customized Training Operations, Eastern Region, Virginia Talent Accelerator Program, with the Virginia Development Partnership; toured the Research facility and CEA center to learn more about CEA and workforce development programs under development.
 - VT’s Center for Economic and Community Engagement

- Current Activities:
 - Bio-Manufacturing / Cell Factory /Bio-Foundry Initiative
 - Contract Research
 - Working with five new companies to develop projects
 - Continuing work with Plant Response/Mosaic
 - Continuing to support Agrosphere’s growth
 - New BASF (creates chemistry for a sustainable future) partnership – contract finalized.
 - New Syngenta partnership established – BASF and Syngenta represent 40% of agriculture worldwide
 - Licensing agreements with six companies are at various stages of development
 - Analytical Chemistry has a new opportunity with JTI Leaf Services to perform testing on tobacco.

- Other Items
 - A SMART table was installed at Hargrave Military Academy.
 - Matt Lohr, Secretary of Agriculture and Forestry, introduced Dr. Lowman to individuals at Cornell University who formed a partnership, GLASE, which focuses on lighting and controls for controlled environment agriculture. The Applied Research department has been asked by Cornell University to join their team on a grant focused on K-12 education using the SMART table as one of the key centerpieces. It will be a multi-institution, multi-state grant (Pennsylvania, Arizona, Virginia, and New York).

Dr. John Hughes commented that the applied research report showed the overall progress of the department.

Action Item: The committee requested a three-year lookback on companies that have experienced growth through IALR research. Mr. Tucker offered to have a one-page information sheet created.

Open Forum of Concerns, Issues, and Observations

No concerns, issues, or observations were discussed.

Adjournment

Mr. Tucker adjourned the meeting at 10:00 a.m.

Minutes Recorded By:

Minutes Approved By:

Ms. Pam Patterson
BOT Secretary

Mr. Telly Tucker
President, IALR

Date

Date

Attachments Included as Official Part of Minutes

Exhibit A – Applied Research Narrative Report, October 2023



Research Committee Report

Dr. Scott Lowman

January 2024

Name of Program or Initiative: Building Virginia's Controlled Environment Agriculture (CEA) Industry Through Targeted Research, Workforce, and Economic Development Initiatives

Current Activities by the IALR/VT team

1) Research

a. Aerofarms Collaboration

- i. Has moved from research to targeted testing of diseases

b. Research Partnerships

- i. New Invasive Species Corporation partnership underway
- ii. The CEA Summit generated 5 new research partnerships
- iii. Canon Virginia is extending its partnership into a third year
- iv. A new research partnership was initialized with a Richmond Virginia company
- v. Electroagro Systems is expanding its partnership with IALR
- vi. Implemented a new herb growth improvement project with Virginia Tech in the Controlled Environment Agriculture Center
- vii. Two Virginia Tech part time student workers have been hired to support the Innovation Center
- viii. A VT PhD student will be starting in the spring

c. Meetings

- i. GoVirginia held the roll out meeting at IALR for the CEA Roadmap Study. Approximately 40 people attended, and the report was well received. Secretary of Agriculture and Forestry, Matt Lohr gave the opening remarks
- ii. Applied Research hosted a visit and tour from the VALOR (Virginia Agriculture Leaders Obtaining Results) Leadership group

d. Grants/Funding

- i. One million dollars was again included in the State Budget for CEA expansion
- ii. **Received** - Tobacco Region Revitalization Commission (TRRC) grant titled "Building a Regional Food System Through the Creation of a Value Chain Coordinator" (\$104,452 request + \$100,000 external match)



- iii. **Received** - Tobacco Region Revitalization Commission grant in partnership with Virginia Tech titled “Supporting Controlled Environment Agriculture (CEA) Growth in Southern Virginia”, (\$145,841 request + \$150,000 external match)
- iv. **Received** – USDA Specialty Crop Block Grant “Biostimulants to Improve Indoor Strawberry Production” (\$54,000)
- v. **Received** – USDA Specialty Crop Block Grant “Biotechnology to Improve Indoor Strawberry Production and Disease Control”
- vi. **Received** - Agrospheres is funding a new employee for 2 years (\$110,000)
- vii. **Submitted** - The applied research team submitted a USDA grant titled “Biocontrol of Pythium Diseases in Lettuce and Spinach Production in Controlled Environment Agriculture Utilizing Beneficial Bacterial Endophytes” with the University of Arkansas. (\$685,732)
- viii. **Submitted** - Dr. Lowman teamed with a startup company focused on AgTech in hydroponics to support three submittals to the Small Business Innovation Research program
- ix. **Submitted** - The applied research team submitted a grant with the University of Georgia titled “The Use of Bacterial Endophytes to Improve Hydroponic Vegetable Production” (\$306,459)
- x. **Submitted** – The applied research team along with Virginia Tech and Cornell University submitted a grant titled “Empowering Greenhouse Resiliency with an Optimized Workforce (E-GROW)” focused on introducing controlled environment agriculture to K-12. (\$149,119 subaward)

2) CEA Economic Development

- a. GoVA report “Leveraging IALR and VT to Move the CEA Industry Forward” has been rolled out and is available upon request
- b. Partnering with the Secretary of Agriculture and Forestry’s office and Virginia Economic Development Partnership to solve real problems facing Virginia’s CEA industry

3) Other Items to Support the Above

- a. A SMART table has been installed at Hargrave Military Academy
- b. Applied Research hosted a visit from Bryan David, Program Director, Southern Virginia/GO Virginia Region 3. He and his team toured the labs and CEA center to highlight the various ways companies are supported
- c. Brian Dail, Managing Director of Customized Training Operations, Eastern Region, Virginia Talent Accelerator Program, with the Virginia Economic Development Partnership, toured the Research Facility and CEA Center to learn more about CEA and workforce development programs under development
- d. Working with JTI to begin analytical testing services



Name of Program or Objective: AgTech and Life Sciences Manufacturing Support to Grow Industries Through Testing, Contract Research, and Lab Access

Current Activities

- 1) Bio-Manufacturing / Cell Factory / Bio-Foundry Initiative
 - a. Submitted an NSF grant to support initial cohorts of students (adult learners) for three years
 - i. GoVa is also interested in exploring a biopharmaceutical manufacturing workforce development component
 - ii. Multiple companies have expressed interest in participating including Novozymes, Agrospheres, and Bonumose
 - iii. Partnership established with Virginia Western Community College
 - b. Similar topics were covered at the Great Indoors Event with Governor Youngkin
 - c. Team has been established to develop first hands on workshop in fermentation. This is a Virginia Tech partnership
 - d. Analytical chemistry is working with JTI to initiate testing
 - e. Initiated a partnership with a Roanoke based company related to biotechnology and fermentation. IP is targeted to be implemented in South Africa
 - f. Signed two new material transfer agreements with biotech companies related to biotechnology
 - g. Established partnerships with 3 new companies from Research Triangle Park to co-develop IP related to biostimulants
 - h. A new non-disclosure agreement has been signed with a venture capital funded startup focused on bio stimulants
 - i. They are interested in lab and office space
- 2) Contract Research
 - a. Currently working with several new companies developing contract research projects
 - b. Continue to do work for Plant Response
 - c. Continue to support Agrosphere's growth
 - i. Expansion of testing and greenhouse support for critical growth products
 - e. New BASF partnership established focused on biologicals and contract research – contract finalized
 - f. New Syngenta partnership established focused on biologicals and contract research – contract finalized
 - g. Licensed 4 strains to a partner company
 - h. Multiple other companies supported
- 3) Economic Development
 - a. An agreement has been signed and a position has been filled for Agrospheres, a company Applied Research has supported over the last four years. The company is renting lab space and office space



- and will be covering the cost of a new technician for two years. This partnership is expected to grow more in the future and they are also exploring licensing some of IALR's biostimulants
- b. An agreement has been finalized with Plant Response, another company Applied Research has supported over the last four years. They will also be renting lab and office space in the Applied Research wing. They are also exploring licensing some of IALR's biostimulants

Highlighted Companies Applied Research has supported over the last 5 years who have had press releases

BGF Industries

Gov. Ralph Northam's office recently announced that BGF Industries Inc. will invest \$7 million and create 65 new jobs by relocating its corporate headquarters and research and development operation from Greensboro, N.C., to the Cyber Park where the Institute for Advanced Learning and Research (IALR) also dwells. As part of its efforts to catalyze regional economic transformation, IALR played a distinct role in supporting economic developers' successful recruitment of this leading U.S. manufacturer and looks forward to an ongoing relationship. BGF, which produces high-performance technical fiber materials, will initially construct a 25,000-square-foot facility in 2019 in the Cyber Park owned by Danville Pittsylvania County Regional Industrial Facility Authority (RIFA). They are in the process of moving onto IALR's campus to take advantage of near-term temporary space and lab space during their facility construction. BGF will occupy two bays, the second floor of the SenTec building and one wing of the Charles Hawkins building. "This most recent investment in the Danville and Pittsylvania Cyber Park will supply us with the R&D capacity and talented workforce to ... succeed in our efforts," said CEO and Chairman of Porcher Industries Andre Genton. In addition to the near-term temporary space, IALR's partnership will provide the following benefits: access to IALR's advanced materials scientist and research expertise, leading-edge equipment and top-rate labs; proximity to the construction site of BGF's new facility; and support services of IALR's administrative staff during BGF's IALR campus residence.

Aerofarms

On behalf of Gov. Ralph Northam, Secretary of Agriculture and Forestry Bettina Ring announced AeroFarms will build its 10th and largest indoor farming operation in Cane Creek Centre, a joint industrial park for the City of Danville and Pittsylvania County. Named in November as one of Time magazine's 100 Best Inventions, the company will invest \$42 million and create 92 jobs. "We are excited to expand to Virginia, an incredible state with a strong farming tradition," said David Rosenberg, Co-Founder and CEO of AeroFarms. "We are also excited about the future collaboration opportunities with the Institute for Advanced Learning and Research to build on our work with Fortune 100 companies to solve broader ag-related supply chain issues." The new, 150,000-square-foot facility will be AeroFarms' largest, most sophisticated indoor vertical farm to date. The company uses proprietary aeroponic growing technology to produce highly flavorful leafy greens at a rate 390 times more productive than field-grown plants. According to the Fourth Quarter 2021 edition of the Virginia Economic Review, published by the Virginia Economic Development Partnership, "David Rosenberg, founder and CEO of New Jersey-based AeroFarms, cited IALR as a major reason why his company chose to build its largest indoor vertical farm to date in Cane Creek Centre."



Plenty

SOUTH SAN FRANCISCO, Calif., Sept. 14, 2022 – Plenty Unlimited Inc. today announced it has secured up to 120 acres of land near Richmond, Virginia, to build the largest, most advanced indoor vertical farm campus in the world. The centrally located Plenty Richmond Farm Campus marks Plenty’s expansion beyond the U.S. West Coast and will bring fresh, healthy produce to the East Coast year-round.

Over the next six years, \$300 million will be invested into the new campus, which is slated to bring more than 300 jobs to Virginia. For more information about future career opportunities at the Plenty Richmond Farm Campus, please visit www.plenty.ag/careers.

Agrospheres

Founded in the Charlottesville area in 2016, AgroSpheres aims to transform agriculture through reliable and affordable biobased solutions. In May of 2023, Governor Glenn Youngkin announced that the company would invest \$25 million to expand in Albermarle County, creating an additional 50 jobs. In late November the company also announced \$25 million in Series B funding round with a strategic investment from FMC Corporation (NYSE: FMC), a global leader in agriculture sciences.

“IALR has been a very helpful partner that we can rely on for any analytical/experimental needs, and now we are hoping to invest back into IALR and increase our presence in the Danville community.” – Ameer Shakeel, Founder & CTO, AgroSpheres

Canon Virginia

Canon Virginia, Inc. (CVI) is pleased to announce a collaboration with the Institute for Advanced Learning and Research (IALR), a local research facility and political subdivision of the Commonwealth of Virginia located in Danville, Virginia, who has engaged a representative from Virginia Tech’s School of Plant and Environmental Sciences to assist in an agricultural project to monitor plant health. CVI is using their patent-pending imaging technology to monitor plant anomalies and external factors that can inhibit plant life such as pests, disease and temperature.

Babylon Microgreens

Today Babylon is announcing an \$8 million Series A, led by Venture South. The round, which also features Virginia Venture Partners, Hull Street Capital and New Theory Ventures, follows a \$3 million seed announced almost exactly two years ago. It arrives as the startup is also announcing \$500,000 National Science Foundation grant. Babylon is still a lean team of 35, based primarily based in Richmond.

CIRC

DANVILLE, Va., July 15, 2022 /PRNewswire/ -- The circular fashion company Circ announced over \$30 million in Series B funding backed by some of the largest international apparel companies and venture capital firms. The investment will help to drive new progress for Circ as they fulfill their mission of protecting the planet from the cost of clothing.

The Institute for Advanced Learning and Research (IALR) has rented lab space and provided various analytical chemistry and research services to Circ throughout the company’s life cycle, epitomizing the mission of regional economic transformation and industry-driven programs, services and support.

Greenswell Growers

WebDec 18, 2021 · After pulling together a small group of investors, Greenswell Growers recently opened a \$17 million indoor farming operation.



Golden Piedmont Labs

The hemp processing facility initially brings 22 new jobs to Halifax County, while also providing an essential market for hemp farmers in the region. Golden Piedmont Labs will invest \$3.26 million to establish a large-scale hemp processing and CBD oil extraction facility

Companies under NDA as well as producers that rely on our testing services also represent a large portion of the businesses we have supported. That data is difficult to track but I wanted to make note of it.