



*The mission of Brown University is to serve the community, the nation, and the world by discovering, communicating, and preserving knowledge and understanding in a spirit of free inquiry, and by educating and preparing students to discharge the offices of life with usefulness and reputation. We do this through a partnership of students and teachers in a unified community known as a university-college.*

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# THE SCIENCE CENTER

## STRATEGIC PLAN 2017-2020

The Science Center Strategic Plan outlines the planning process that will inform the future growth and direction of the Science Center over the next three years. The ideas put forth in this document by Gelonia Dent, Ph.D., director of the Science Center, evolved collaboratively with David Targan, Ph.D., associate dean of the College for Science Education and Oludurotimi Adetunji, Ph.D., associate dean of the College for Undergraduate Research and Inclusive Science. We also acknowledge the valuable feedback contributed by the Dean of the College and members of the Science Center Advisory Board<sup>1</sup>, who represent all branches of the science disciplines at Brown and the alumni community, in the development of this plan.

### HISTORY

The Science Center, established in 2010, would not exist if not for the exemplary vision and leadership of Dr. David Targan and members of the science faculty. In 1990, Dr. Targan, while teaching introductory physics courses, envisioned other ways to engage his students outside of the classroom. To this end, over the past 20 years at Brown, he has worked to promote science as a naturally occurring creative process, championed the importance of representation of women and students from historically underrepresented groups<sup>2</sup> in the sciences, and leveraged his expertise in science education to implement innovative strategies that improved science teaching, broadly across campus. Dr. Targan's vision for the Science Center was that it become the *hub for science* on the campus of Brown University that links scientific research, teaching, and service.

### MISSION

The Science Center mission is to foster interdisciplinary science collaboration among Brown faculty and students, to advance students' curiosity about science, and to promote the societal benefits of scientific research, broadly.

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<sup>1</sup>Maud S. Mandel PhD, Dean of the College and Professor of History and Judaic Studies; Science Center Advisory Board Members: Galen Henderson, MD President Brown Alumni Association, Ravi Pendse, PhD, Vice President for Computing and Information Technology/Chief Information Officer; Jill Pipher PhD, Vice President for Research, Elisha Benjamin Andrews Professor of Mathematics and Jason Sello, PhD, Associate Professor of Chemistry.

<sup>2</sup> HUG includes those who report themselves as Hispanic or Latino, American Indian or Alaska Native, Black or African American, or Native Hawaiian or Other Pacific Islander. For faculty, HUG also includes those who report themselves as "2 or More," provided at least one of the reported categories is in the above list. In 2004, Asian or Pacific Islander was a single reporting category. In this chart, respondents who reported themselves as Asian or Pacific Islander are categorized as Asian.(from Pathways to Diversity and Inclusion An Action Plan for Brown University).

The next sections provide an outline of the goals, an evaluation strategy, and the organizational structure of the Center.

## GOALS

We will expand the Science Center's reach and impact on and beyond the campus in five areas, some currently underway, which will expand the Center's reach and impact on and beyond the campus.

- Goal 1.** Establish a scientific knowledge exchange framework
- Goal 2.** Retain undergraduates in the science concentrations, broadly.
- Goal 3.** Promote and advance the societal benefit of scientific research and scholarship
- Goal 4.** Build visibility and collaboration across campus and beyond
- Goal 5.** Support the institutional commitment to creating an equitable, diverse, and inclusive community, particularly among scientists at all levels.

## OBJECTIVES, ACTIONS, AND OUTCOMES

### GOAL 1: ESTABLISH A SCIENTIFIC KNOWLEDGE EXCHANGE FRAMEWORK

#### OBJECTIVE 1. DESIGN AND BUILD A SCIENTIFIC KNOWLEDGE EXCHANGE FRAMEWORK

The core work of the Science Center is to facilitate knowledge transfer between novices and experts. The process through which knowledge transfer occurs is called knowledge exchange, that is, a dynamic process that incorporates distinct forms of knowledge from multiple sources (Ward et al. 2012). We will construct a scientific knowledge exchange framework that fully encompasses our core work guided by the following actions.

#### ACTIONS

- ❖ Research existing knowledge exchange frameworks from different domains
- ❖ Access and analyze our existing programs to identify essential elements for knowledge exchange
- ❖ Build a scientific knowledge exchange theoretical framework inherent to the activities of the Science Center

#### OUTCOMES

- ❖ The Science Center, as a hub for science, will become synonymous with scientific knowledge exchange

#### OBJECTIVE 2. DEVELOP AND IMPLEMENT PROGRAMMING TO EXPLORE RELEVANT INTERDISCIPLINARY TOPICS THROUGH THE SCIENTIFIC KNOWLEDGE EXCHANGE FRAMEWORK

#### ACTIONS

- ❖ Identify relevant and/or timely knowledge domains that are of interest to our science community

- ❖ Identify appropriate topics and effective mediums to facilitate scientific knowledge exchange

#### OUTCOMES

- ❖ Programs such as science communication, science policy, workshops for faculty and postdocs on broader impacts, and partnerships with groups such as Brown/RISD STEAM are designed using the scientific knowledge exchange framework
- ❖ Formative and summative assessment results are used to refine the programs and make the framework robust

## GOAL 2: RETAIN UNDERGRADUATE STUDENTS IN SCIENCE CONCENTRATIONS

### OBJECTIVE 1. PROVIDE ACADEMIC SUPPORT AND PRE-PROFESSIONAL ADVISING/MENTORING TO STUDENTS IN SCIENCE CONCENTRATIONS, PARTICULARLY HUGS IN THE PHYSICAL SCIENCES

#### ACTIONS

- ❖ Create unique and innovative programmatic opportunities to fortify students' experiences in science
- ❖ Sustain programs, such as Brown Science Prep, New Scientist Collective (NSC), SACNAS@Brown, Women in Science and Engineering (WiSE), and Learning Exchange, which support students in the science disciplines
- ❖ Conduct surveys to collect data about students' experiences in the concentrations and feedback on programmatic activities

#### OUTCOMES

- ❖ Increase our understanding of the factors that inhibit students' interest and persistence in studying science.
- ❖ Disseminate our best practices on retention of undergraduate students in science concentrations at conferences and in publications in peer reviewed journals

### OBJECTIVE 2. ATTRACT SCIENCE FACULTY TO MENTOR AND TRAIN STUDENTS CONCENTRATING IN THE SCIENCES

#### ACTIONS

- ❖ Facilitate the partnering of faculty with HUG students for research training and mentoring
- ❖ Assist in efforts to institutionalize strategies to improve student performance in introductory STEM courses and auxiliary, evidence-based, high-impact activities developed by HHMI- and AAU-funded departments
- ❖ Develop on-ramps into the research enterprise for first and second year students in the sciences who have never before engaged in scientific research

#### OUTCOMES

- ❖ Raised awareness of informal and formal communication between science faculty and students
- ❖ Sustained connections with guest speakers and opportunities for them to mentor and sponsor interested students

### GOAL 3: PROMOTE AND ADVANCE THE SOCIETAL BENEFIT OF SCIENTIFIC RESEARCH AND SCHOLARSHIP

#### OBJECTIVE 1. FACULTY AND STUDENTS ARE MUTUALLY ENGAGED IN ENDEAVORS THAT LINK ONGOING RESEARCH TO MEANINGFUL SOCIETAL IMPACTS

##### ACTIONS

- ❖ Develop activities that focus on the societal benefits of research for campus and local communities
- ❖ Establish infrastructure for creative science communication and science policy
- ❖ Promote new and existing connections with faculty and students involved in innovation and entrepreneurship

##### OUTCOMES

- ❖ Faculty and students have the essential tools needed for meaningful public engagement with science
- ❖ Faculty and students understand how to engage and communicate societally relevant outcomes of their scholarly research to specific stakeholders
- ❖ Science Center provides opportunities for interaction between students and faculty in Science and Society, Development Studies, Economics, Engineering, Computer Science, Sociology, etc., and provides support and guidance for entrepreneurship ventures

### GOAL 4: BUILD VISIBILITY AND COLLABORATION ACROSS CAMPUS AND BEYOND

#### OBJECTIVE 1. DISSEMINATE INFORMATION BROADLY ABOUT THE SCIENCE CENTER'S PROGRAMMATIC ACTIVITIES

##### ACTIONS

- ❖ Collect and analyze data to understand the impact of all programmatic endeavors
- ❖ Document programmatic activities; archive and share events through social media platforms
- ❖ Generate and distribute regular reports on the Center's programs

##### OUTCOMES

- ❖ The Science Center is a hub for scientific knowledge exchange by both faculty and students
- ❖ Establish a regional and national reputation for supporting and promoting eminence in science

#### OBJECTIVE 2. BUILD SUSTAINABLE COLLABORATIONS WITH OTHER CAMPUS, PEER INSTITUTIONS, AND LOCAL ORGANIZATIONS

##### ACTIONS

- ❖ Build partnerships with other units and departments on science-relevant programming
- ❖ Build partnerships with other peer institutions around mutual science related interests

- ❖ Expand partnerships with local institutions, such as RI STEAM Center, by strengthening ties and creating more opportunities for our students and faculty to engage

#### OUTCOMES

- ❖ Establish new campus partnerships
- ❖ Expanded programs through co-sponsorship of events with local and peer institutions

### GOAL 5: ENDORSE THE INSTITUTIONAL COMMITMENT TO EQUITY, DIVERSITY, AND INCLUSION

#### OBJECTIVE 1. ADVOCATE FOR DIVERSITY, INCLUSION, AND EQUITY IN THE SCIENCES

##### ACTIONS

- ❖ Highlight the efforts of those science departments on campus that are engaged in transformative activities that broaden participation of faculty and students in STEM fields
- ❖ Expose the science community at Brown to a broader set of scientists from diverse backgrounds and careers to share their work and various perspectives on being in science

##### OUTCOMES

- ❖ Helped foster an inclusive and diverse scientific community as described in the University's strategic plan and diversity and inclusion plan (see references)
- ❖ Increased participation of science faculty in training and mentoring of HUG undergraduate researchers

### EVALUATION STRATEGY

The Science Center will adopt a summative evaluation approach for this strategic plan. The following steps will be applied to each goal:

1. Identify all stakeholders and participants who are directly involved in the activity or program
2. Determine key issues that must be addressed in order to generate the desired outcome(s)
3. Determine whether the outcomes are short-term or long-term
4. Determine the appropriate data and assessment measure for all programs
5. Perform the appropriate data analysis
6. Disseminate results to appropriate audiences

### ORGANIZATIONAL STRUCTURE

The Science Center is part of the Office of the Dean of College (DOC). The operational staff is comprised of a director, a program coordinator and a minimum of 15 student-staff members. In addition, the two associate

deans serve in managerial roles, and as coordinators of DOC science-related programs or committees supported through the Center<sup>3</sup>.

**Table 1. Science Center Administrative Staff**

Name & Title	Contact	Location
Gelonia L. Dent, Ph.D. Director	<a href="mailto:Gelonia_Dent@brown.edu">Gelonia_Dent@brown.edu</a> (401)-863-1629	Science Center Room 328
Nicole Williams, MS <sup>4</sup> Program Coordinator	<a href="mailto:Nicole_Williams@brown.edu">Nicole_Williams@brown.edu</a> (401) 863-6806	Science Center Room 321
Oludurotimi Adetunji, Ph.D. Associate Dean of the College for Undergraduate Research and Inclusive Science; Director, Research Impact	<a href="mailto:Oludurotimi_Adetunji@brown.edu">Oludurotimi_Adetunji@brown.edu</a> (401) 863-2411	University Hall Room 213
David Targan, Ph.D. Associate Dean of the College for Science Education	<a href="mailto:David_Targan@brown.edu">David_Targan@brown.edu</a> (401) 863-2314	University Hall Room 213

#### SCIENCE CENTER ADVISORY BOARD<sup>5</sup>

The Science Center Advisory Board consists of four (4) appointed members from the ranks of faculty, administration or alumni, of Brown. These appointed Board members will serve a two-year term, with a one-year renewal, if so desired. Our expectation is that members will make valuable contributions to the direction of the Center towards its mission during their time of service.

Advisory Board Members appointed July 1, 2016:

**Dr. Galen Henderson**, President Brown Alumni Association, Director of the Division of Neurocritical Care, Brigham and Women's Hospital-Boston

**Dr. Ravi Pendse**, Vice President for Computing and Information Services/Chief Information Officer

**Dr. Jill Pipher**, Vice President of Research and Elisha Benjamin Andrews Professor of Mathematics

**Dr. Jason Sello**, Associate Professor of Chemistry

<sup>3</sup> Update and clarify the roles of the associate deans affiliated with the Science Center (GLD July 2019).

<sup>4</sup> Joined organization July 2018.

<sup>5</sup> Current board consists of three appointed members. Voting previously stated that Director and Deans will comprise one vote, with Director having final decision to avoid ties on an even-numbered board.

The board will employ consensus decision-making, and utilize consensus voting, wherein the Director, affiliated Deans together, and members, shall comprise one vote each. Should a position on the board be vacated prematurely, an appropriate candidate will be selected to fill the spot as soon as possible.

## REFERENCES

Vicky Ward, Simon Smith, Allan Hose & Susan Hamer. (2012). "Exploring knowledge exchange: A useful framework for practice and policy". *Social Science & Medicine* 74(3), 297-304

<https://doi.org/10.1016/j.socscimed.2011.09.021>

Brown University 10-year strategic plan. "[Building on Distinction: A New Path for Brown](#)"

2016 Brown Plan for Diversity and Inclusion. "[Pathways to Diversity and Inclusion: An Action Plan for Brown University](#)"