

## Interdisciplinarity at Duke:

### A Brief Inventory of Connections among Schools and University-Wide Institutes, Initiatives, and Centers

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Over the past decade, Duke’s university-wide institutes, initiatives, and centers (UICs) have pursued a deepening set of connections with Arts & Sciences, the Nicholas School of the Environment, the Pratt School of Engineering, the Sanford School of Public Policy, the Graduate School, the Schools of Medicine and Nursing, the Fuqua School of Business, and the Schools of Divinity and Law. The UICs have the related roles of **convening** new scholarly configurations, **catalyzing** new research agendas and pedagogical frameworks, and **connecting** faculty and students across disciplinary, divisional, and school boundaries. They also furnish an array of cross-cutting infrastructures that facilitate the work of faculty and students within schools. Thus these organizations supply university-wide public goods to Duke’s many and varied intellectual communities.

The following overview discusses the linkages among UICs and Duke’s schools, with regard to Duke’s central missions of research, teaching, and societal engagement.

<b>Duke University Institutes, Initiatives, and Centers (UICs)</b> (Interdisciplinary units that receive core funding from the Provost)	
<b>Center for Genomics and Computational Biology (GCB)</b>	<b>Duke University Energy Initiative (DUEI)</b>
<b>Duke Global Health Institute (DGHI)</b>	<b>Franklin Humanities Institute (FHI)</b>
<b>Duke Innovation &amp; Entrepreneurship Initiative (I&amp;E)</b>	<b>Kenan Institute for Ethics (KIE)</b>
<b>Duke Institute for Brain Sciences (DIBS)</b>	<b>Information Initiative at Duke (iiD)</b>
<b>Duke Initiative for Science &amp; Society (S&amp;S)</b>	<b>Nicholas Institute for Environmental Policy Solutions (NIEPS)</b>
	<b>Social Science Research Institute (SSRI)</b>

### Research

UIC support for interdisciplinary research begins with considerable **logistical assistance**. Collectively, the UICs annually manage around \$31 million worth of grants for faculty across the university, currently including every school except Nursing and Divinity. (Three-fourths of the \$11 million in Facilities and Administrative costs charged to these grants flow to the school of the principal investigator[s]; the UICs receive none of the so-called “indirects” associated with

these grants). SSRI provides especially extensive grants management, handling all of the Sanford School's grants, as well as number of awards for faculty in Arts & Sciences, Fuqua, and the Nicholas School.

UICs supply crucial **technical services and training** to faculty and students across Duke. The GCB, for example, furnishes customized genetic sequencing for labs in the biological sciences, biomedical engineering, and the School of Medicine. SSRI offers solutions to data storage dilemmas, as well as privacy management services for sensitive data. Science & Society offers intensive high-level training in science communications to an annual cohort of faculty members and postdocs. Some institutes and initiatives similarly provide extensive methodological training to faculty and students. SSRI, for instance, offers a steady schedule of workshops on quantitative methods in the social sciences, as well as one-on-one training sessions and a forty-hour a week help-desk.

Every institute and initiative provides **administrative support, funding, space, and strategic advice** to a wide assortment of interdisciplinary centers, working groups, projects, labs, and scholarly networks. Most of these groups are run by tenure-track faculty whose tenure home resides in a department or a school; all of them have significant participation by school-based scholars. These collective endeavors range from the cluster of two- to three-year Humanities Labs in the Franklin Humanities Institute, to the Rethinking Regulation network sponsored by the Kenan Institute for Ethics, to the Nicholas Institute's research working groups, large centers such as the Center for Cognitive Neuroscience within the Duke Institute for Brain Sciences, or the long-term research projects supported by the Duke Global Health Institute (together with partners abroad).

The **intellectual communities** fostered by the UICs include the usual talks, lectures, seminar series, and roundtable discussions, which pull in faculty from every school. But they also reflect significant innovations for both individualistic and more collaborative scholarship. The FHI Manuscript Workshops fall into the first type. These gatherings involve a full day's discussion of an author's book manuscript, with an interdisciplinary group of faculty readers from Duke, as well as two external scholars and the acquisitions editor from the relevant scholarly press. (KIE has now begun its own manuscript workshops based on the FHI model).

Innovations involving collaborative research often revolve around **seed grant programs**. Incubator awards at DIBS (approximately \$400,000 per year) have launched 40 interdisciplinary collaborations since 2007. Global Health has similarly provided significant travel and pilot grants (this year the focus is on global mental health)

#### Examples of External Grants Emerging from UIC Seed Funding

Duke's Humanities Writ Large initiative received a **\$6 million grant** from the Andrew W. Mellon Foundation. This emerged from the **Franklin Humanities Institute's** seed funding in the form of Humanities Labs, research groups that give undergraduates an opportunity to participate with faculty and graduate students in problem-solving projects and humanities networks.

Pratt faculty member Tuan Vo-Dinh leveraged the findings from his **Energy Initiative** Seed Fund awards into a successful proposal for a large external grant. Vo-Dinh's team received a **\$2 million grant** from the Department of Energy for a project that will literally shine light on the molecules that help increase plant growth into biofuels.

since its inception – with \$627,000 going to twenty-seven investigators over the last three fiscal years. More recently, DUEI, iiD, GCB, SSRI, I&E, NIEPS, and KIE have all established seed grant programs. Several of these efforts have involved partnerships with other Duke UICs and/or schools (e.g., Energy with iiD and Pratt). Last year, KIE embarked on a significant seed grant program in conjunction with fellow Kenan Institutes at UNC, NC State, and the NC School of the Arts. Collectively, these programs now distribute more than \$1 million per year to support innovative interdisciplinary collaborations among Duke faculty; a growing number of these projects are now attracting significant external grants (from both foundations and government agencies). In 2014-15, for example, four iiD-supported projects received major NSF awards that total almost \$6 million; a number of other proposals are pending.

For the better part of a decade, mechanisms for **joint hiring between UICs and schools** have driven connections that overlap with many of the above strategies and programs. Some of these appointments occurred through an annual call for proposals from the Provost, with an associated amount of financial support that walked down to the schools over several years on a graduated basis. Still other faculty have received joint appointments outside the walk-down program. (An Appendix furnishes an overview of all joint appointments, including these joint hires.)

## Education

The role of UICs in undergraduate and graduate education has expanded greatly over the past five years. Institutes and initiatives provide opportunities to administer (or create) programs that draw upon faculty from multiple schools. There is now **one undergraduate major and one co-major** administered by UICs – Neuroscience (run by DIBS) and Global Health (run by DGHI) – each of which now attracts more than ninety students per class. (Both of these concentrations are also available as minors.) The Energy Initiative administers the Energy Engineering minor for Pratt. **Four undergraduate certificate programs** are currently administered by UICs. Science & Society is responsible for Genomics Sciences and Policy; Innovation & Entrepreneurship for the like-named certificate; the Energy Initiative oversees Energy and the Environment, in conjunction with the Nicholas and Pratt Schools; and KIE runs an Ethics certificate. FHI has also received approval to begin a new Human Rights certificate. UICs provide convening infrastructure and shoulder the administrative load for each of these programs.

### Education Programs Administered by UICs

#### Doctoral Programs

Cognitive Neuroscience Admitting Program  
Computational Biology and Bioinformatics

#### Doctoral Certificates

Global Health

#### Masters Programs

Bioethics and Science Policy  
Global Health

#### Masters Concentrations

Energy

#### Undergraduate Majors

Neuroscience

#### Undergraduate Co-Majors

Global Health

#### Undergraduate Minors

Energy Engineering  
Global Health  
Neuroscience

#### Undergraduate Certificates

Energy and the Environment  
Ethics  
Genomics Sciences and Policy  
Innovation and Entrepreneurship

**At the graduate level,** DGHI runs Global Health masters degrees both in Durham and at Duke Kunshan University, as well as a Global Health doctoral certificate, while Science & Society oversees a Bioethics masters. In addition, the Energy Initiative takes care of the Energy Concentration for the Nicholas School's masters in Environmental Management, while I&E is now furnishing support for the Law School's new law clinic on start-ups. Within DIBS, the Center for Cognitive Neuroscience runs the Cognitive Neuroscience Admitting Program for doctoral students interested in the many disciplines that fall under this domain of inquiry. GCB administers the PhD program in Computational Biology and Bioinformatics, which has about half of its graduate students in departments in A&S and Engineering and about half in the School of Medicine.

Several UICs (DGHI, SSRI, KIE, FHI, NIEPS) **furnish additional interdisciplinary opportunities for graduate students** – chiefly the chance to interact with faculty mentors outside their discipline, integration in UIC seminars/events, research and travel grants, the facilitation of internship opportunities, and in some cases, partial stipends. FHI, for example, hosts a Ph.D. Lab in Digital Knowledge to assist graduate students who wish to incorporate information technology into their research toolkits, in addition to incorporating several Ph.D. students into each of its Humanities Labs. KIE's MADLAB similarly engages a cluster of doctoral candidates in its activities, while NIEPS now has a few fellowships that link graduate students to one of its research teams. I&E, moreover, has created major business plan competitions for both undergraduate and graduate students. DGHI maintains a Doctoral Scholars Program that places a doctoral student on a research team with a mentor other than the main adviser, and offers substantial support for research in the field.

**Bass Connections** complements these curricular responsibilities and co-curricular modes of support. Five UICs oversee Bass Connections themes – the Energy Initiative is in charge of Energy (with NIEPS faculty taking lead roles on several teams each year); DGHI of Global Health; DIBS of Brain & Society; iiD of Information, Society, & Culture; and SSRI of Education & Human Development. Each theme annually funds and advises around eight interdisciplinary, vertically-integrated research teams, collectively involving faculty and students across all ten schools. The themes also are developing new gateway courses, inventorying related undergraduate classes, and providing intensive summer research experiences like iiD's Data+ and DGHI's Student Research Training Program. Although the courses associated with Bass Connections are targeted at undergraduates, the research teams involve approximately 100 masters/professional students each year, of whom more than 20 are doctoral students.

## **Engagement/Outreach**

Through the establishment of centers, field sites, and especially networks that include NGOs, industry, governmental officials, and other decision-makers, UICs have expanded the number of platforms from which Duke faculty members can have an impact beyond academia. NIEPS has fashioned a **model of serving as a counselor to the policy process**, which other institutes are also adopting. This approach depends on a process of anticipating the likely directions of policy agendas, and then investing in preliminary high-level research related to those pressing

### Recent Examples of UIC Impact

[Duke Launches Autism Research App](#)

[Duke Research on Refinery Regulation Cited in Clean Power Plan](#)

[Duke One Health Research Leads to Notable Swine Flu Finding](#)

[Symposium Emphasizes Plight of Unaccompanied Child Migrants](#)

[Program Simplifies, Lowers Cost of Solar Installation](#)

[Duke Study in Peru Yields Unexpected Discoveries](#)

questions and issues. When NIEPS correctly identifies looming policy debates, it is well-positioned to offer timely analyses (whether about fisheries management, climate change regulation, or other environmental concerns) to stakeholders. Even when the Institute offers such analysis through a bilateral relationship with a policy-making entity, it always makes its reports available to the public.

Within SSRI, the Center for Global Governance and Competitiveness has adopted a similar framework around global value chain analysis, which it furnishes to clients such as NGOs, development banks, and the governments of lower-income countries. S&S has two analogous undertakings – an *amicus curae* project that will prepare policy/legal analyses of scientific issues likely to become the subject of high stakes appellate cases; and a legislative tracking project to allow researchers to remain

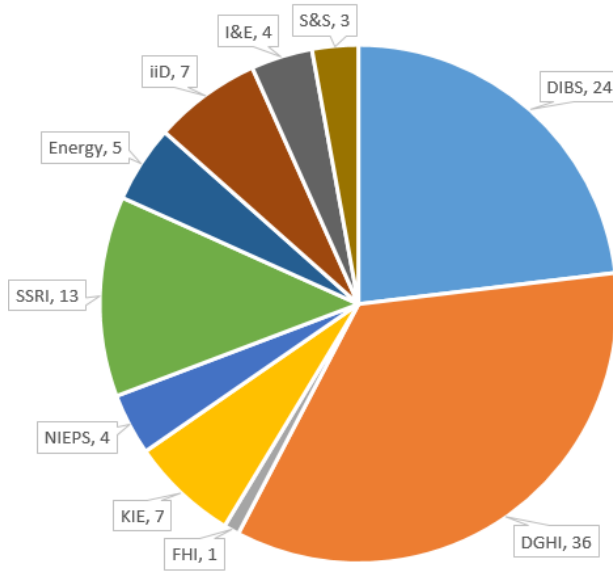
abreast of state and national legislative action on science policy. SSRI is also developing several research projects around partnerships with local community organizations that focus on education.

At I&E and iiD, outreach focuses more on **partners in the business world**. The former has now rolled out an angel network that seeks to expand the supply of venture capital in the Triangle, and to make that capital available to entrepreneurial Duke students, faculty, and alumni. iiD is building relationships with a growing number of firms and NGOs that can serve as clients for either Data + projects or Bass Connections teams. At DGHI, outreach encompasses businesses, government agencies, NGOs, and health facilities, all around the theme of developing new medical techniques, new approaches to healthcare and wellness, and new modes of delivering services within lower-income countries.

For FHI, KIE, and DIBS, outreach has focused on **public scholarship**. FHI and KIE pursue civic engagement around the theme of human rights, which for each has spawned DukeEngage projects. Both also support the **creation and dissemination of new digital data** (a key output for all the Humanities Labs, as well as Rethinking Regulation’s oral history project). For DIBS, a key goal has been community outreach, through public events such as science cafes that seek to explain recent scientific findings to a broad audience.

**Appendix: "Joint" UIC-School Appointments (104 total)**

**...by UIC:**



**...and by School:**

