

Philip Beesley RCA FRAIC

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Philip Beesley focuses on the rapidly expanding field of 'smart' buildings interwoven with artificial intelligence. Beesley has taught at the University of Waterloo School of Architecture since 1996 and has been a full professor since 2011, appointed University Professor in 2023. His Waterloo roles include core graduate studies in architecture and bridge across Arts, Science and Engineering at Waterloo.

Beesley's scholarship answers pressing challenges: the explosion of integrated technologies, sustainability, and profound social transformations demand that we reimagine building models for public architectural space. The very focus of architecture must shift from end-product buildings that are static, solid, and that constrain communities to a fixed vision, into adaptive, dynamic, and sustainable structures that can support sheer viability by embracing the diversity and dynamics of human occupants. Beesley is uniting national and international networks of researchers and creators around the hypothesis that solutions lie in developing a new architectural paradigm drawn from the ingredients of life itself - scaffolds, information, and metabolisms - transforming architectural practice, product, and process alike. This leadership is establishing *living architecture* as an emerging multifaceted discipline, creating the necessary foundation with core groups of partners, and launching long-term alliances based on the full articulation of necessary materials, tools, and methods.

His provocative questions frame an empathetic, sensitive, humane, and sustainable future for the built environment, asking: can architecture come alive, responding, thinking, and caring about us? How can responsive, interactive and artificial-intelligence systems that are emerging within contemporary architecture combine into the new discipline of living architecture? Can divided humanities and technical practices combine within this new discipline to achieve circular economies, biosource materiality and human agency? His work includes three objectives:

1. New sustainable materiality: Design innovative resilient and sustainable scaffolds by integrating lightweight next-generation digitally fabricated biomaterials supported by circularity methodology.
2. New dissipative topologies: Establish physical networks of resilient living architecture organized by deliberately unstable geometries that permit radical distribution of responsive systems, in fields of empathetic machinic behaviour.
3. New worldmaking conversations: Initiate new kinds of conversations between humans and sentient architecture by designing interfaces and controls directly coupled to digital twin virtual spaces, seeking mutual relationships and infused with the generative fields of comprehensive pattern languages and system descriptions.

This knowledge creation is expanded by prominent dissemination within public art and design communities, featuring innovative research-creation works. Sensitive art expressions within integrated visual and multidisciplinary media are accompanied by precisely framed theory, cultural-historical context, and design paradigms, expanded by open-source reproducible models and patterns. His test-bed installations combine ongoing scientific research in machine learning and complex-systems constructions integrated with immersive expressive architectural environments.

[1][2][3][4][5] His Waterloo Architecture-hosted SSHRC Partnership entitled Living Architecture Systems Group includes 60 research-creation organizations with some 150 contributors across North and South America, Europe, the Middle East, Asia and Oceania. His research (h-35, i10-49) anchors his leadership of the SSHRC Partnership Living Architecture Systems Group which gathers the scholarship of multiple partner institutions (MIT, UCL, CMU), knowledge-creation societies (ACADIA, American Society for Cybernetics), and knowledge-creation programs (EU Horizon EnTimeMent, Keck Futures, Futurium Mobile) and supporting urgently needed transformations of the discipline of architecture. His distinction as Finalist of the 2022 SSHRC Impact Award for Partnerships demonstrates involvement and impact. His creation and direction of Waterloo's Riverside Architectural Press has created dozens of publications with international partners. Beesley's work has also proliferated widely in popular culture (K-pop band BTS at ROM Transforming Architecture, collaborations with couture icon Iris van Herpen worn by A-list figures such as Celine Dion, Lady Gaga, and Bjork).

His work is recognized by global distinctions (FEIDAD, STARTS, VIDA), national awards (Dora Mavor Moore, Prix de Rome), popular global press (Vogue, New York Times), media (Colossal, Wired), multiple traveling exhibitions (Vitra: Hello, Robot!; MAK: Beauty), online lecture series (DigitalFUTURES, China Academy of Art; European Graduate School), exhibitions at global venues (2022 Hong Kong Design Institute, 2021 and 2010 Venice Biennale for Architecture; 2021 Dubai World Expo, Futurium Noosphere Berlin) and permanent testbed installations (Poietic Veil, Technical University of Delft; Amatria, Indiana University; Chun Long Tiao, Shangduli Watertown Shanghai; Aurora, West Edmonton Mall Canada) whose in-person visits now number in many millions. The CGI-based film Cradle, created by Beesley in collaboration with Cannes Lion-winning London directors Warren du Preez and Nick Thornton Jones is now in circulation (HKDI Hong Kong, Richmond-Adelaide Centre public art projections). Dissemination of immersive exhibitions by major cultural institutions (Royal Ontario Museum, MAK Vienna, Vitra Museum Basel) is expanded by ongoing touring presentations.

Beesley's contributions include far-reaching inclusive outreach programs dedicated to under-represented communities (examples this year: BIPOC community Emancipation Month Toronto "Superbloom" film; HXOUSE network Toronto 2019-21; three Beirut-based student seminars with current collaborative funding initiatives; BIPOC Renew Forsyth Winston-Salem workshops and testbed initiative, North Carolina). STEAM curriculum and 'tinkering' kits featuring low-cost biosource materials are now being integrated with summer camp and after-school curriculum oriented to young children for nonspecialist explorations of complex systems (Waterloo LAUNCH Meander program, Amatria Indiana University thirteen summer camps, three TU Delft Science Centre workshops, Palestine Texas public school curriculum, two years of Riverview High School New Brunswick programming). Open-source licensing of these digital fabrication and assembly kits are disseminated through a folio series distributed by Riverside Architectural Press online, accompanied by distribution in print and ebook form by Amazon and major retailers.

The LASG has mounted ten large international installations that include innovative test-bed research environments, and has contributed to numerous other international group exhibitions and presentations. The first phases of a multi-year collaboration with TU Delft have now been committed, pairing Waterloo faculty with multiple disciplines in the Netherlands. The U.S. National Academy of Sciences presented the LASG's Sentient Chamber environment within the historic National Academy of Sciences building in Washington. The Keck Foundation, the principal funder of the National Academy of Sciences, recognized the LASG with a Keck Futures funding award. The Geneva-based research partnership of CERN hosted three research exchanges with LASG collaborators, exploring how LASG

conceptions of tangible dimensions might intersect with interactions at subatomic scales. Former President Guen-Ye Park of South Korea lauded the LASG's Epiphyte Chamber installation, which inaugurated the National Museum of Modern and Contemporary Art in Seoul, citing it as a model for how Korean art and technology should be integrated.

Interdisciplinary integration is at the heart of Beesley's contributions. Current examples of programming exchanges within Waterloo include the innovative Tech Art coursework crossing Engineering and Fine Arts with Rob Gorbet, ECE and Architecture (Meng PhD, capstone design project Mechatronics); exchanges with IMMERSE Games Institute between English and Architecture (Coleman), exchanges with Knowledge Integration in Environmental Sciences (Gorbet), Virtual Reality Lab within Psychology (Ellard) and application of multivariable complex-systems sustainability analysis in Civil Engineering (Shahi). New Beesley courses have been developed during the past five years accompanied by innovative new cross-disciplinary inclusive learning kits and many volumes of original courseware and manuals including the new Introduction to Interactive Systems design-based elective and Emerging Theory in Organicism seminar.

Past innovations by Beesley include establishing the first digital fabrication and visualization laboratory in Canadian Architecture schools (Waterloo CFI ICVDM, 2000); innovation of immersive-scale 'testbeds' integrating art and science (Futurium Berlin, Indian University, Science Centre Delft, Meander Cambridge), founding conceptions of 'living architecture' helping to frame and anchor that new subdiscipline, first distributed 'tessellated' cellular arrayed topology (Orgone Reef, Manitoba, 2001), the introduction of the term 'digital tectonics' (Beesley + Seebohm, eCAADe, 2000); early conceptions of responsive architecture (Responsive Architectures: Subtle Technologies ed. Beesley, Ruxton, Hirose 2006); implementation of early examples of distributed interactive sentient architecture (Epiphyte Soil, 2003; Hylozoic Soil, 2006; Hylozoic Ground, 2010).

[1] <https://www.designlinesmagazine.com/philip-beesley-architect/>

[2] <https://www.cbc.ca/news/entertainment/bound-for-the-venice-biennale-1.919158>

[3] <https://www.thisiscolossal.com/2017/12/philip-beesley-living-architecture/>

[4] <https://www.vogue.com/article/lou-stoppard-fashion-together>

[5] <https://www.vice.com/en/article/d74zxq/a-chamber-of-lights-that-feels-what-you-feel>