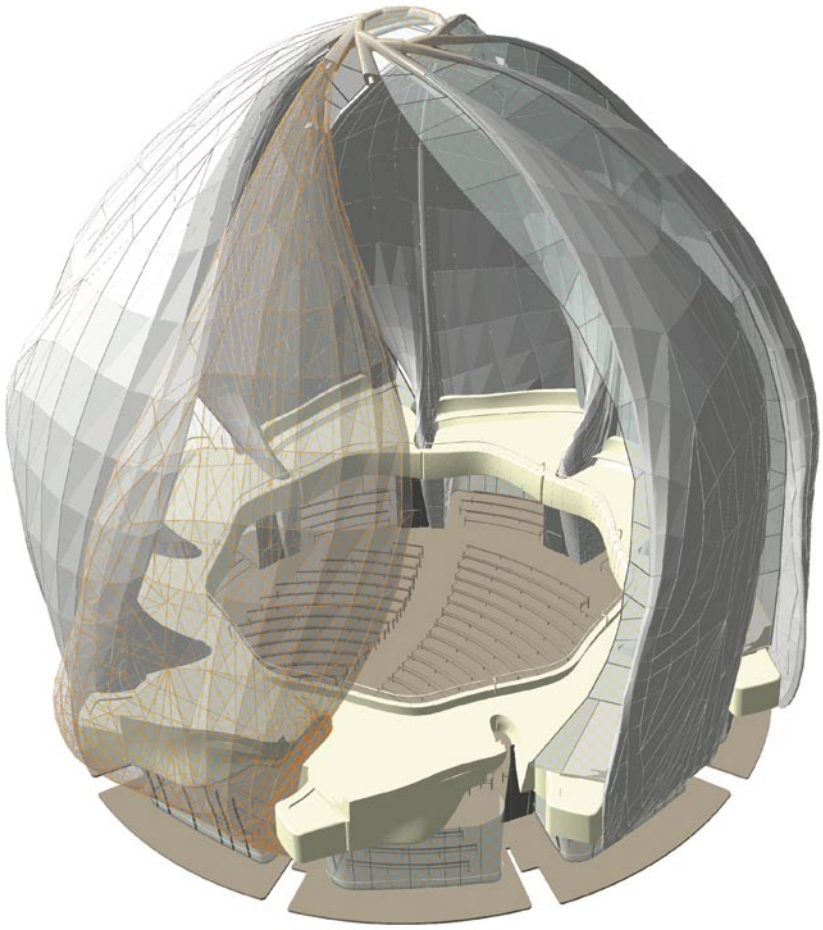
Bahá'í Temple temple of light

Siamak Hariri Partner, Hariri Pontarini Architects
by Marsha Kelmans

The winning entry by Toronto's Hariri Pontarini Architects (HPA) for the design of the Bahá'í Temple for South America in Santiago, Chile has not gone unnoticed by the architectural community and media. Sumptuous images of the "Temple of Light" described by Gary Michael Dault as "a soap bubble that has alighted, momentarily, on the ground" reveal a dramatic departure from the firm's portfolio. HPA is responsible for McKinsey & Co. in Toronto and the Schulich School of Business at York University (with RYWA in joint venture). Their work is characterized by close attention to proportion and composition through the meeting of materials. Using conventional methods of construction, the firm is capable of producing a high level of detail refinement. While their projects have historically been rectilinear, the curve had already begun to enter their work, appearing in the secondary skin of the ceilings at the Schulich School, the renovation of Flavelle House, Faculty of Law, University of Toronto and the Art Collector's Residence in Toronto's Bridle Path area. In comparison, the Temple of Light is a biomorphic expression of materializing light made possible by a high level of formal, structural and tectonic inventiveness. It is of value

to examine how an office known for their intensive design process and emphasis on craft approaches the conceptualization of this new direction in their work. As the degree of the Temple's complexity necessitates the introduction of digital modelling, we can examine the role these techniques play relative to traditional methods of design exploration.

The design process began in the summer of 2002 when HPA was shortlisted in a two-part competition and continued for close to a year when the winning entry was announced in June 2003. This demanded a significant investment of time and resources as well as the commitment and faith required to sustain an intensive design exploration prior to securing the commission. Their rigour and tenacity had paid off when the client presented HPA with ambitious criteria requesting a design that was to be "as perfect as humanly possible." Led by Partner-in-Charge Siamak Hariri and Associate-in-Charge Michael Boxer, the HPA team initiated the process by attempting to ascertain the rudimentary meaning of temple for a forward-looking religion that embraces universality. The last of eight mother temples spread across different continents, the Chile Temple had to be at once impressive to the international eye and inviting to the common visitor. While we often associate places of worship with historic structures, the relatively new Bahá'í faith is still in the process of defining its iconography. Part of the initial dilemma was negotiating the competition brief requirement for a domed structure with contemporary architectural expression. The answer for the Temple was to attempt to move beyond iconography turning instead to conditions found in nature to explore the fundamental dome. The design was inspired by the vaulted space formed on the underside of the tree canopy and the quality of light experienced when looking up through its filigree of branches.



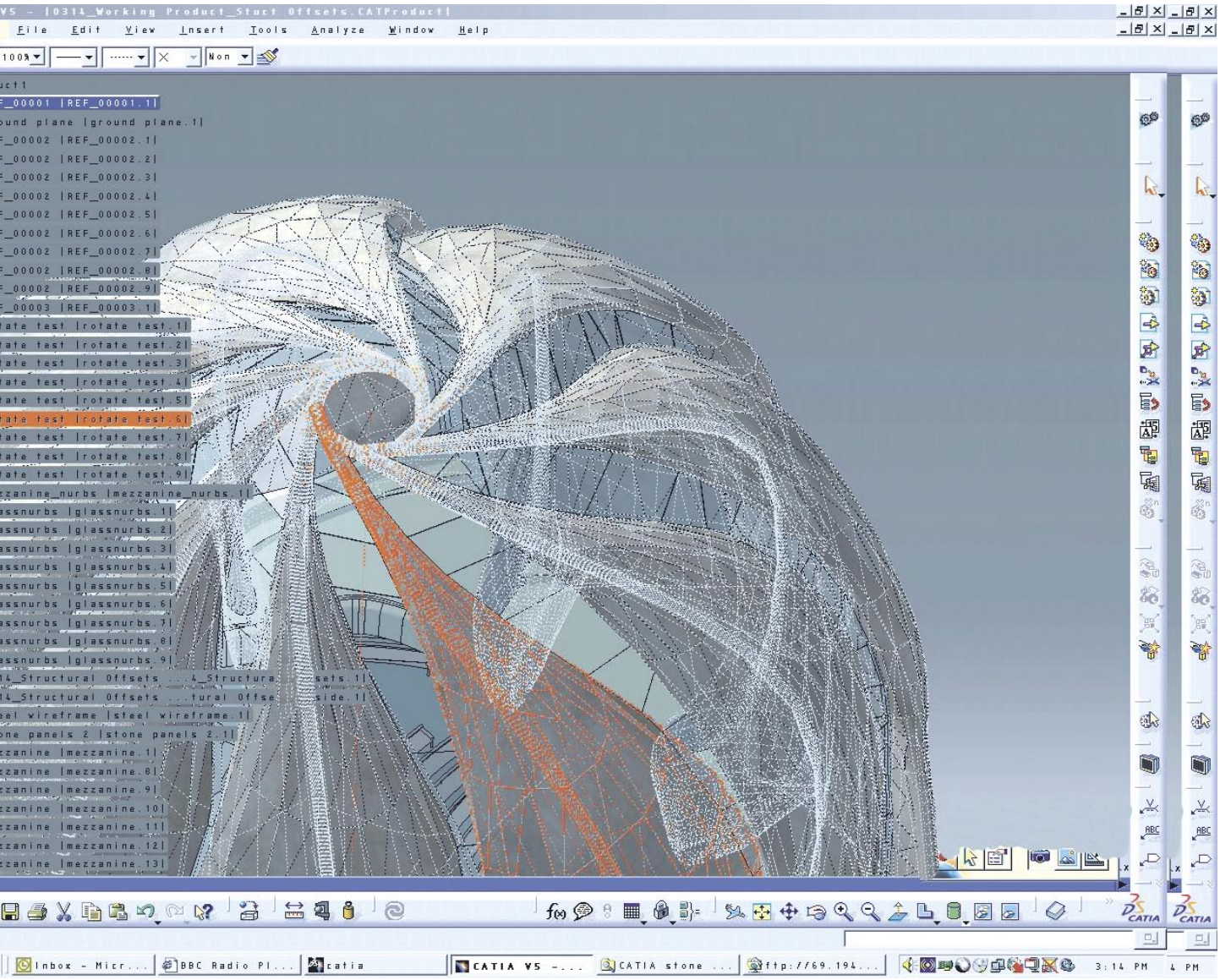
To avoid reverting to known devices, design team members made a conscious decision to step out of their habitual work environment, typology and process. Working from a design annex in a studio space established by George Simionopoulos, a model-maker contracted for the Temple, the team struggled to work with geometries that were for them uncomfortably new, to produce what is described by Hariri as *"nine gracefully torqued wings which enfold the space of the Temple. These vast wings are made of two delicate skins of translucent, subtly gridded alabaster. Between these two layers of glowing translucent stone lies a curved steel structure (the source of the faintly discernible 'gridding') enclosed in glass, its primary structural members intertwining with secondary support members, not unlike the structural veining discernible within a leaf."*

The kernel of the parti emerged from the first hand-built model in which brass wire was wound around a small wooden egg producing a dome-shaped space described by brass filigree and supported by an external rib structure. The team then turned to digital modelling using Maya, an application developed for animation commonly used for special effects in the film industry. In keeping with the office's established process of cross-pollination between different media, digital photographs of the brass model were introduced as a series of background images which were traced to create the original Maya model. Maya modelling is extremely pliable allowing for the production of complex forms impossible to detail with the human hand. The ribs were stretched to create leaves or wings that now comprise the Temple with traces of the original rib still discernible creating a gentle undulation. The team continued to explore the emerging form through different media working back and forth between Maya modelling, hand renderings and CAD drawings which were continuously inputted into Maya, and physical modelling exploring materiality and structure. Various cladding materials were tested to arrive at the translucency and quality of light implied by the digital model, finally settling on alabaster cladding for the interior and exterior wing surfaces. Unlike the parti in which the interior space and structure were conceived of as separate elements, the evolved design gained unity, no longer discerning between interior, exterior and structure. However, the articulation of the interior draws directly from the original brass model

and the notion of light filtered through filigree. Having evolved from wisps present only where the wings part to planes that echo the interior surface, the wood tracery basket creates a counterpoint to the alabaster surfaces, elaborating the play of light and shadow.

During a recent stage of development the design team was faced with the dilemma of how to construct the Temple. While Maya is extremely useful for formal exploration, it allows for indefinite suspension of issues of scale, structure and tectonics. To better understand the wing form, a plastic rapid prototype was fabricated using information from the Maya model which made it clear that traditional 2D CAD working drawings would not be sufficient in describing and exploring the surfaces and structure. Team members travelled to Los Angeles to participate in an intensive workshop offered by Gehry Technologies, an offshoot of Frank Gehry's design practice, to learn a second digital modelling application called CATIA and strategize about its implications for design development. Used to tame the undulating forms of Gehry's projects, CATIA was originally developed for the airplane manufacturing industry and like CAD is extremely precise and somewhat rigid. It does, however, have the capacity to process and represent the complexities of the steel space-frame structure being developed for the Temple, its multitude of connection nodes, as well as the panellization of its alabaster skin. The present challenge is to ensure that the subtle qualities of the previous design phase are not muted by CATIA's rationalizing effect. The play of light on the irregular curve of the wing surfaces is a significant aspect of the design producing a sense of varied experience despite the repetition of nine identical wing forms. CATIA's tendency to standardize curved forms and cladding dimensions was overcome by an insistence on privileging surface definition derived through Maya and hand-crafted drawings and models. This necessitates the development of individualized cladding panels as well as several different types of customized stone anchors for various locations on the wing surfaces. The strong design agenda articulated with the help of other media ensures that it is CATIA that is tamed, thus allowing the project's rich imagery and possibility of multiple readings to remain intact.

At a time when the "bottom line" represents an increasingly influential factor in architectural production it is incumbent upon us to examine the potential for design exploration and production efficiency offered by digital modelling as a method of maintaining integrity in the design process. As we have seen, Maya modelling contributes a great potential for easily describing complex form and testing the play of light, as well as for its rich rendering capabilities. However it must continuously be tested against hand-crafted or other types of digital models that impose a physical rigour. Applications such as CATIA have the potential to eliminate the working drawings stage by allowing architects to provide contractors with digital documents in which all aspects of the construction are described in a 3D model. While far from an industry standard, this practice is already available with a few highly specialized contractors. The potential for new freedom in the design process is further increased by the compatibility of this type of digital document with CAD/CAM processes that could create a paradigm for design possibilities by redefining the accessibility of custom construction. However, like any new technology, we must be careful to maintain the tool in its rightful place and not allow our work to be too closely defined by it or fall into the trap of form or effect for its own sake. Each media or mode of representation brings with it not only different information and potential for exploration but also its own particular imagery and bias. The sustained research and indefatigable efforts of the Temple of Light design team demonstrate that the presence of the hand must always be maintained as a foil to digital technology. The hand which brings with it the possibility of the fortuitous error, the varying line weight within a single stroke and the subtly changing curve, maintains intact the intuitive thought process and direct relationship to the work whose success ultimately depends on its material presence.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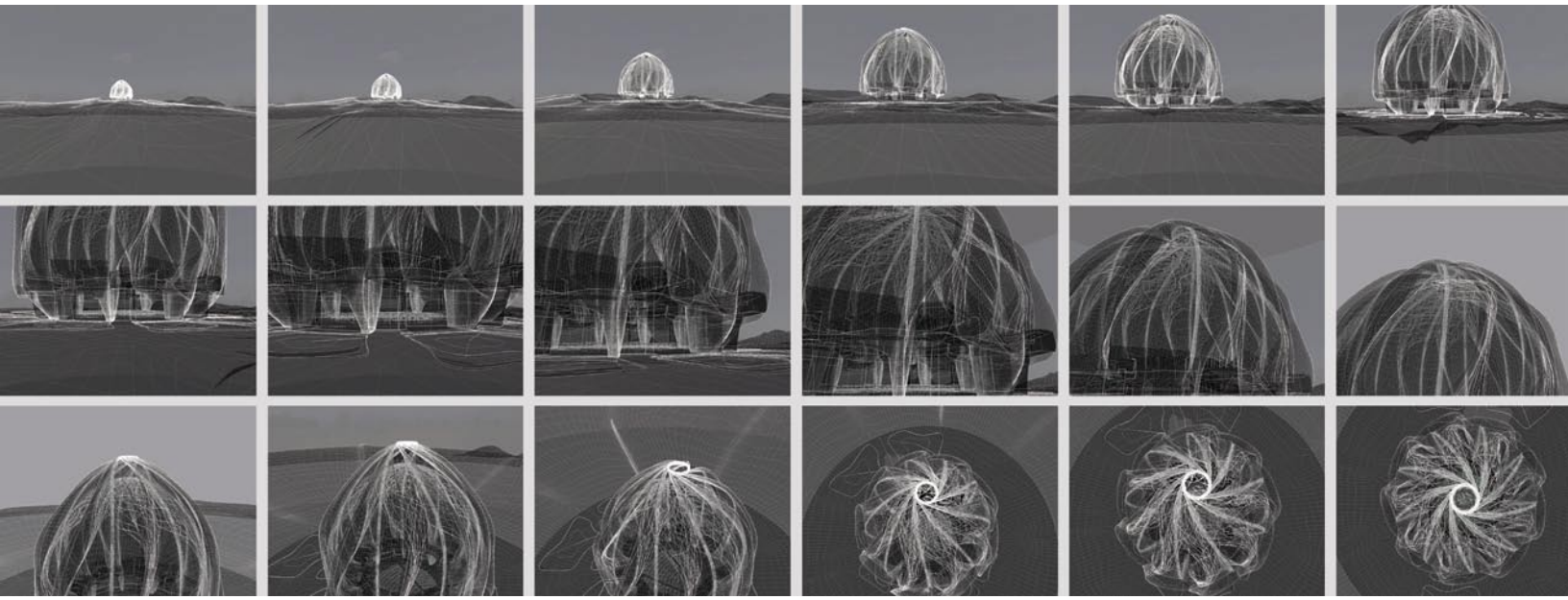

Siamak Hariri grew up in Toronto, studying architecture at the University of Waterloo and receiving his Masters degree from Yale University in 1985.

Siamak's projects have received much recognition for their innovation and design excellence, including the Toronto headquarters for McKinsey & Company; the MacLaren Art Centre in Barrie; Robertson House Crisis Care Centre, Toronto; and the Schulich School of Business at York University (in joint venture with Robbie Young + Wright Architects) for which Siamak was Partner-in-Charge of Design.

The Hariri Pontarini Architects team includes Siamak Hariri (Partner-in-Charge), Michael Boxer (Associate-in-Charge), Jaegap Chung, Adriana Balen, Justin Ford, Naomi Kriss, Tiago Masrour, Ed Sweeney (Maverick Solutions), Mehrdad Tavakolian, Soheil Mosun, Patrick Kwok, Donald Peters, George Simionopoulos. For more information on the Bahá'í Temple, see: www.temple.cl.bahai.org

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