

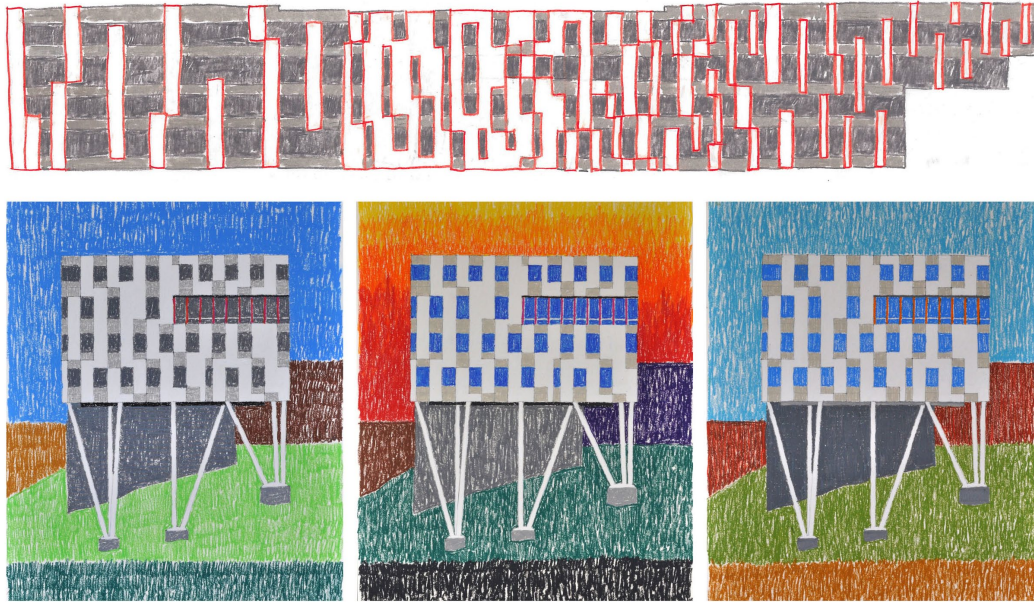
UrbanGlass

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In the Glass Quarterly publication Hot Sheet

ARCHITECTURE: A Portland, Oregon, architect harnessed her love of glass art to win a competition to design a striking new building at Carnegie-Mellon



Scott Hall at Carnegie Mellon University, Photo Jeremy Bittermann, 2017. Dichroic Light and building design by OFFICE 5 Architecture.



Michelle LaFoe, Color study triptych. Oil pastel. H 19, W 24 in. Photos by Dan Kvitka.

When she's not in her Portland, Oregon, architecture studio, Michelle LaFoe can often be found at Bullseye Glass Co., where she takes classes, attends visiting artist lectures, and indulges her general fascination with glass. LaFoe's passion was sparked by Chagall's iconic glass work *American Windows* (1976) a painting in which metallic oxide paints were permanently fused to the glass with heat. When, in 2011, LaFoe was asked to submit a proposal for a new building at a prominent university, she was able to bring together her glass interests and advanced materials research with her professional practice. For what would become her and partner Isaac Campbell's largest project to date, she proposed a glass building that is as alive chromatically as the dynamic scientific research taking place inside its walls at Carnegie-Mellon University's Pittsburgh campus.

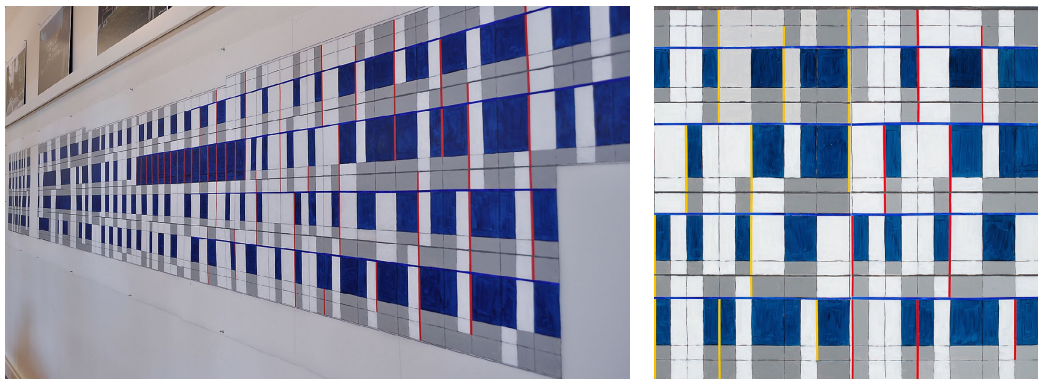
Since opening their firm in 2010, OFFICE 52 Architecture, located in industrial southeast Portland has been dedicated to the intersection of art and architecture, pursuing projects that enable them to flex their creative minds and provide the customer with elegant solutions to programmatic needs. Their bid for the newest academic building at Carnegie-Mellon re-imagined the call for a seven-story building plan. Instead, she proposed the concept of a 4-story glass-curtain-walled building atop sculptural, structural steel columns with a connected sunken nano-research lab situated underground, which converts the previous loading dock area into a state-of-the-art green roof, beautifying that space as well as protecting the research lab from the exterior environmental effects.



Scott Hall at Carnegie Mellon University, Photo Jeremy Bittermann, 2017. Dichroic Light and building design by OFFICE 5 Architecture.

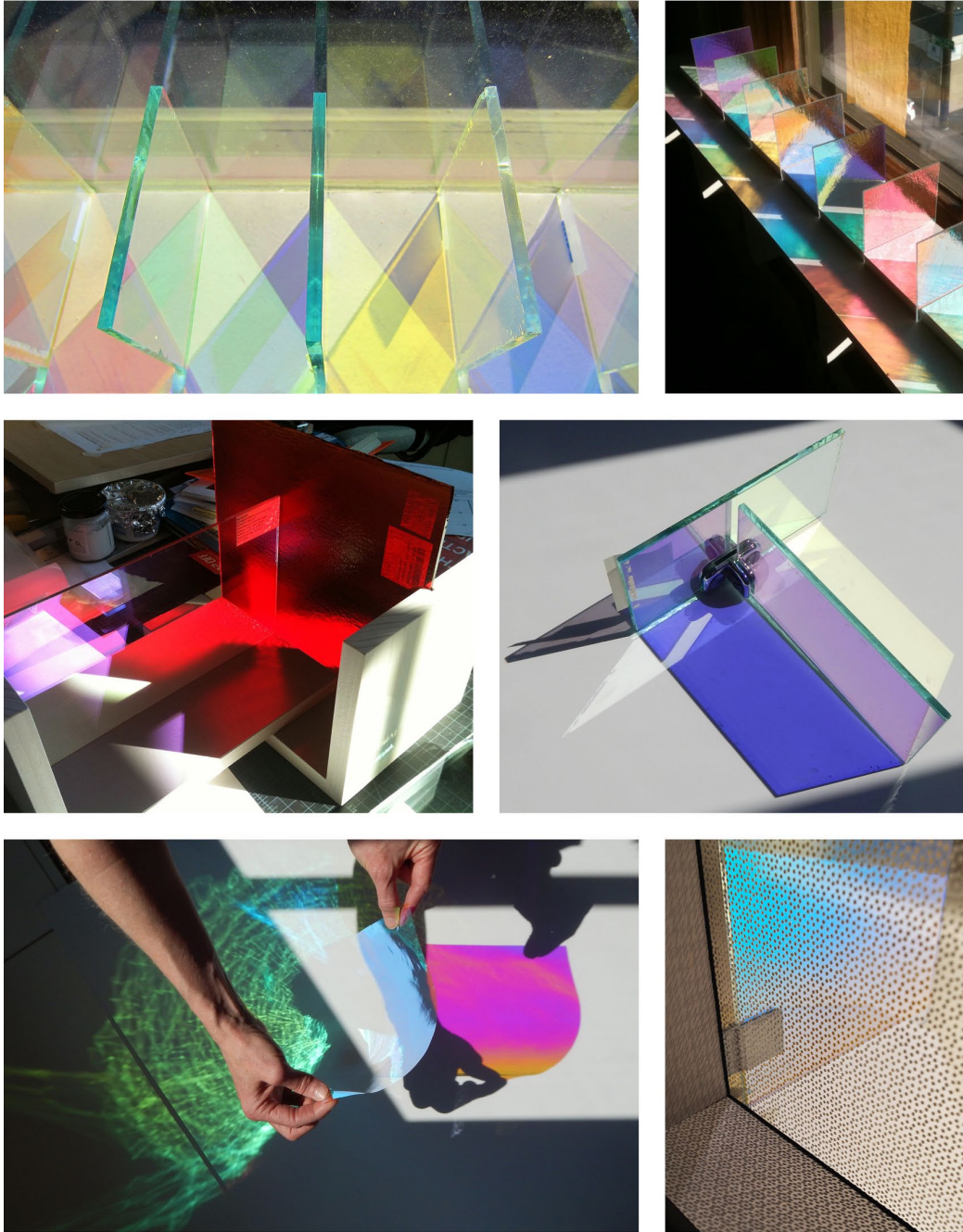
Isaac Campbell has been similarly passionate about glass since working with Al Held on his glass murals for the Washington DC Airport. Together with LaFoe, he pays special attention to light and color in all of their projects. However, for the design of the new nanotechnology, biotechnology and energy technologies building, they “viewed it as an art installation in itself”. Their innovative design uses a ceramic frit application to the entire curtain wall and dichroic glass fins for added sun shade creating a cohesive, colorful composition. In a phone conversation with the Glass Quarterly Hot Sheet, LaFoe said she believes this building will set a precedent for “the incorporation of an artistic aesthetic and facade composition with a large amount of colored-dichroic glass and the nano-derived geometry for the ceramic glass frit.”

Inspired by works of Olafur Eliasson, Soo Sunny Park, Ed Carpenter, and Jun Kaneko, LaFoe and Campbell became even more seduced by the possibilities of glass in architectural installations. Unfortunately, the vibrant, colorful glass from the art world was unable to be manufactured in the size and with the structural requirements needed for an architectural project. The designers’ challenge was to translate their artistic vision and love for colored glass into the very function of a building. They succeeded, with the help of SCHOTT AG Glass, a German glass company that has supplied dichroic glass to other projects such as the Bavarian State Opera in Munich, Germany, the Harpa Concert Hall & Conference Centre in Reykjavik, Iceland and the Shopping Mall Printemps in Paris, France.



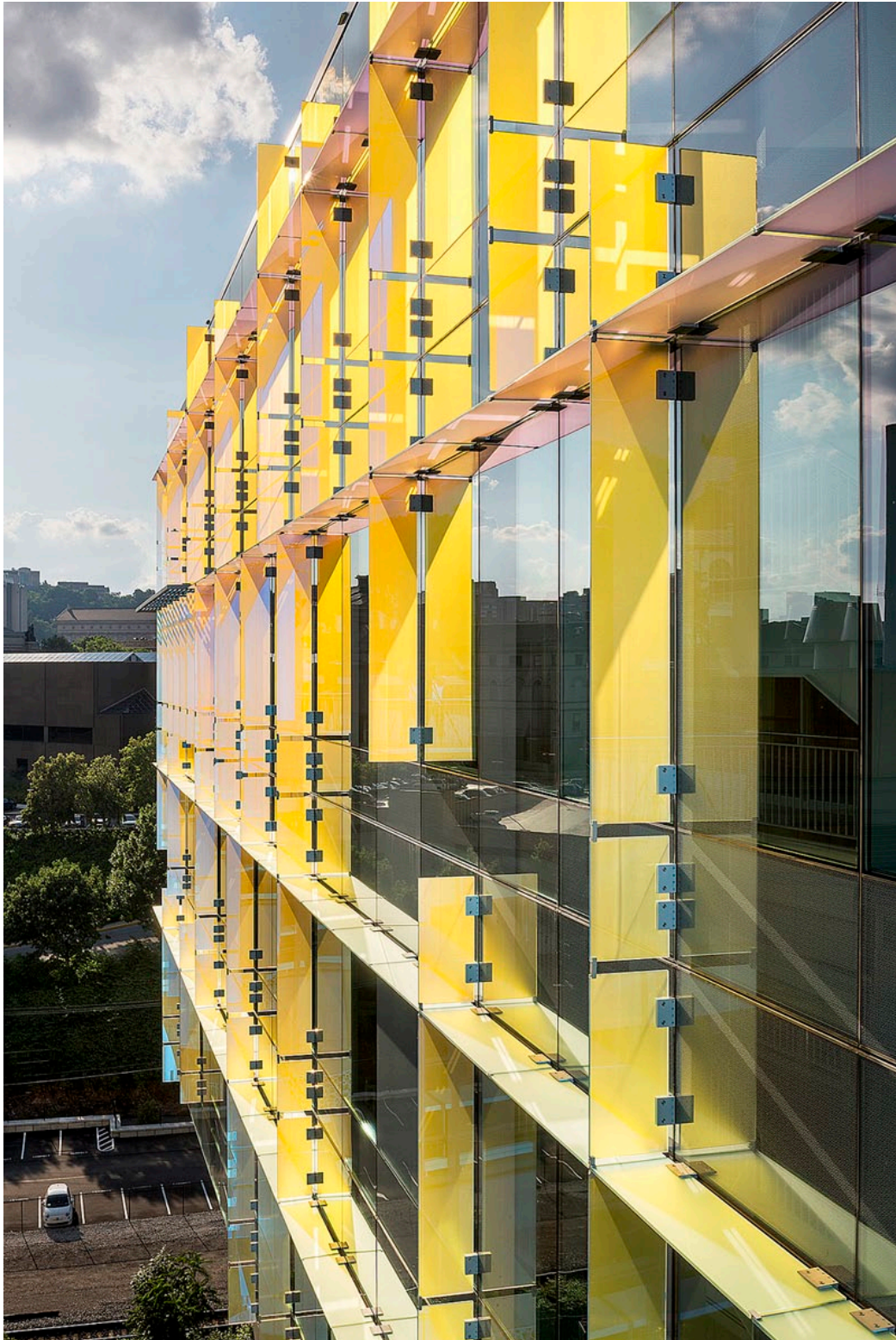
Left - Michelle LaFoe, Unfolded elevational facade study, was a work in progress 2014-2018. Acrylic paint and pen on mylar. H 42, W 240 in. courtesy: OFFICE 52 Architecture.
Right - Michelle LaFoe, Façade studies with golden yellow and red fins, 2013. Acrylic paint and pen on mylar. H 31, W 32 in. courtesy: OFFICE 52 Architecture.

Beating out 16 other, larger architecture firms from across the country, OFFICE 52 Architecture finished construction of the new science building named the Sherman and Joyce Bowie Scott Hall in the heart of CMU’s downtown campus in 2017. At its core, the design concept manifests those pedagogical aspirations of the institution itself - celebrating sustainability and the collaborative culture of the university. The 109,000-square-foot building



Michelle LaFoe, Dichroic light studies and models. courtesy: OFFICE 52 Architecture.

is LEED Gold certified, and nurtures greater transparency and connectivity, while also presenting an integrated artistic element where the activities of the building are reference in the details of the facade. The puzzle pieces aligned for this project to be fully realized. Since large-scale installation and architecture projects typically go through intensive value-engineering at some point, LaFoe states “it would’ve been easy to cut out the artistic piece”, but the board remained excited about the connection between interior program and exterior facade, and fortunately, one of the primary donors, Joyce Scott, is an artist herself and was a major proponent for the use of colored glass.



Dichroic Light at Scott Hall, Photo Isaac Campbell, 2017. courtesy:OFFICE 52 Architecture

Having achieved one of the largest installations of dichroic glass in the U.S., LaFoe andv Campbell are proud of designing a building that glows with colors that change throughout the day according to the angle and strength of the sun as well as the position of the viewer. At night, the colors become a softer pastel version of their daytime colors, maintaining a luminescent facade. LaFoe describes the experience: "When you're walking around you'll see these lines and patches of color that you can walk on - the transmitted glass color - and it moves and changes with the sun so when you go back at different times of the day, it'll be in a different position and change to a deep blue or yellow depending."

The majority of their inspiration was drawn from the work the researchers were doing inside the building. After delving into the programmatic needs of the building, they discovered that the origination dichroic glass is based on nanotechnology processes. From the Greek word "dikhroos" meaning "two-colored", dichroic glass is created through a highly technical vacuum deposition fabrication process which is a nanoscience derivative of thin film deposition technology developed by NASA in the 1950s for satellite mirrors. Specially treated quartz crystal and metal oxides vaporized to adhere on a glass pane intensifies the multiplicities of shadows available to the eye when hit with light and thus changes depending on the source of light and the angle of the viewer. Coatings are carefully controlled to produce gemstone colors when light passes through the glass which has a transmitted color and a completely different reflective color. Its ephemeral, hypnotizing qualities are now employed in many different industries beyond the aerospace industry and its application in the arts world remains to be determined by the imagination of the artistic community.



Richard Hoyen, Watercolor Rendering of OFFICE 52 Architecture's Dichroic Glass Concept for the Competition Winning Entry, 2011. Watercolor. H 11, W 17 in. courtesy: OFFICE 52 Architecture.



Left - Scott Hall at Carnegie Mellon University, Photo Jeremy Bittermann, 2017. courtesy: OFFICE 52 Architecture.

Right - Construction site mock-up of dichroic glass fins and ceramic frit glass panel. Photo Isaac Campbell. courtesy: OFFICE 52 Architecture.

Complimenting the dichroic glass, LaFoe and Campbell chose a specific light gray color for the ceramic frit application which is an abstraction of a geometric representation of a microscopic nanoscience photonic quasicrystal structure. Reference images for this pattern were taken from what the scientists saw inside their microscopes. In order to achieve a 40% and 60% overall opacity, depending on location for solar load, to achieve LEED Gold certification, OFFICE 52 worked with Vericon to adhere a ceramic frit, composed of minute glass particles, pigment and a medium, that is then tempered or heat strengthened to fuse the frit to the glass. The dot matrix shifts to a horizontal or vertical, semi-transparent linear band repetition as you move farther away; a perception shift that is similar to the shifting visible patterns of those particles activity through atomic microscopes. A major proportional study of the existing elevations, columns and friezes of the traditional campus buildings designed by Henry Hornbostel in the early twentieth century determined the dimensional sizing of the bands of the frit. Seamlessly blending old and new aesthetics, “the visual lines actually continue with our building,” explains LaFoe, “which already has a huge transformation on the feel of the whole quad.”

OFFICE 52 Architecture built many models - works of art in their own right - both physically and virtually, to test exactly how the colored dichroic fins were to be attached and how their color related. They eventually decided

on vertical Narima Orange and horizontal Narima Blue/Gold dichroic fins to create a plethora of changing colors from warm amber to cooler grape because “it was the one that just sung out” LaFoe explains. “It was intuitive, and we said ‘that’s it! That’s beautiful’. There’s this feeling when you hit it and just know that’s the right combination.” In order to heighten the colored light field experience they decided to paint the interior a warm white so as not to dull the saturation of the projected light. The custom dichroic sun-shading fins were attached to each curtain wall panel by hand before it was hung in place vertically. The final fins seem to float perpendicular to the facade, casting a rainbow of colors that dance across the interior and those that fall in the cast shadow; each window provides dramatic views, and natural light resplendent with color.



Dichroic glass and ceramic frit on the South facade, Photo Jeremy Bittermann, 2017.
courtesy: OFFICE 52 Architecture

The combined frit-patterned curtain wall and dichroic glass panels unfold to create a Mondrian-esque painting in light and glass. “When it comes to architecture, people tend to be afraid of color, and I think it’s part of our obligation to introduce people to color and in a way show them how to feel comfortable with it,” states LaFoe. In their early conceptual drawings, LaFoe and Campbell used oil pastels to highlight the importance of their vision; each panel position was carefully selected so viewers can read the composition as it wraps around the building. OFFICE 52 also uses the colorful dichroic glass and ceramic frit pattern as a tool to dissuade birds from flying into the windows since their vision is even more expansive than the human eye and can see colorful visual queues well beyond our imagination. As more contemporary glass high rises of urban environments



Dichroic Light Interior, Photo Jeremy Bittermann, 2017. courtesy: OFFICE 52 Architecture.

go up, the threat to birds increases as they fly into the windows that reflect the environment. A number of cities including San Francisco and Toronto have passed bird friendly initiatives for high rising buildings, and although Pittsburgh doesn't have these standards, LaFoe states that "it's something that we believe is important; even if it's not written into the specs."

LaFoe predicts her favorite view might change from the oblique view of the south facade to the view granted by a future pedestrian bridge, a design element included in the original competition submission, which will connect the quad to the other side of the street to land near the Carnegie Museum of Art, allowing viewers to walk by the entire south side elevation. Michelle LaFoe and Isaac Campbell have forced a new way to see well known spaces as well as uses of materials and LaFoe has successfully incorporated her passion into her profession, recreating her favorite experiences at Bullseye in Pittsburgh, offering an ephemerally evocative and transformative world of color, texture and light.



Oblique evening view, Photo Jeremy Bittermann, 2017. courtesy: OFFICE 52 Architecture



Oblique dusk view, Photo Jeremy Bittermann, 2017. courtesy: OFFICE 52 Architecture.



Oblique day view, Photo Jeremy Bittermann, 2017. courtesy: OFFICE 52 Architecture.

<https://urbanglass.org/glass/detail/scott-hall>

Established in New York City in 1977, UrbanGlass fosters experimentation and advances the use and critical understanding of glass as a creative medium.

Michelle LaFoe and Isaac Campbell are founders of OFFICE 52 Architecture, a cross-disciplinary studio practice working at the intersection of Architecture, Fine Arts, and Technology and recognized for its innovative and distinctive approach to design with the juxtaposition of traditional and advanced materials, natural light, outside-the-box design thinking, and creative programming and problem-solving. OFFICE 52 Architecture is based in Portland, Oregon.

Michelle is a licensed architect and accomplished artist who has designed award-winning higher education, museum and architectural installation projects and has exhibited internationally. She received her B.Arch and B.Arts at Rice University and a Post-Baccalaureate Graduate degree in drawing and painting from the School of the Art Institute of Chicago. As a Distinguished University Research Fellow, she completed her M.Arch in architectural history and theory at the University of Illinois in Champaign-Urbana and a year of post-graduate research at Yale University in design and fabrication technology. She has worked in the design studio of Cesar Pelli, FAIA, and was a Fulbright Scholar in Italy and recipient of a grant from the Graham Foundation for Advanced Studies in the Fine Arts.

Isaac Campbell has designed sustainable and award-winning buildings for educational institutions, and cultural, corporate, and private clients locally and internationally. His work has been recognized with awards from the American Institute of Architects and the Society for College and University Planning. Isaac began his career in the office of AIA Gold Medal winner Cesar Pelli, FAIA, where he was a Design Team Leader for major projects including the Chubu Teiju Cultural Center and Museum in Kurayoshi, Japan; the New York Times Headquarters Competition; and the coordination of the Art Program for the Washington National Airport with work in glass, mosaic, and metal and studio visits with international artists including Al Held and Nancy Graves. Isaac received his B.Arch. and B.Arts from Rice University.