



Sarah Hall

# A Passionate Career

Kathy Kranias

## **1. What do you believe is the relationship between stained glass, art, and craft?**

Stained glass can transcend craft to become art.

## **2. Can you share your thoughts on stained glass innovations of the past 40 years?**

The entire past century has seen incredible innovations in stained glass — so much so we no longer use the words *stained glass* for our windows, and have yet to find generally accepted new terminology.

When I began my studies in Architectural Glass at Swansea College of Art in 1975, the primary technique was leaded glass using antique glass which was acid-etched, silver-stained, sandblasted and painted with brown or black paint. *Dalle de verre* and appliqué (lamination) were also well-known techniques. Our antique glass sheets, uneven in thickness, were from Hartley Woods and small (60cm x 45cm) so the pieces we cut, treated and leaded were also small. Our kilns were small as well. Painting on glass with enamels was rarely done as the enamels of the day were limited, poor in colour and adhesion.

The artistic influence in our department came from post war German pioneers who gave master classes at Swansea — Schaffrath, Schreiter, Poensgen and Klos.





Sarah Hall

German pioneers (from left to right) Meistermann, Schaffrath, Schrieter, Poensgen, Klos; and Lawrence Lee, Marc Chagall

Meistermann, Thorn-Prikker, and Wendling had a strong impact through photos we saw. Their aesthetic was one that used leaded antique glass with strong, graphic leadlines, integrated with the architecture, or as a counterpoint to it. Following Swansea, my artistic direction became more painterly, influenced by Lawrence Lee and Marc Chagall.

There have been enormous advances in glass technology which have had a great impact in our field. These advances have been driven by many factors — artistic, economic, and the requirement for our art glass to meet standardized building codes for glass. Now common in Europe are large scale paintings made with enamels on float glass (with excellent colour and permanent adhesion), huge kilns, mechanical sandblasting, digital printing on glass, computer cut stencils, air-brushing of glass paint, fluorescent and metallic paints, screen-printed imagery, 3-D laser etching, CAD for design work and full sizing of cartoons, photo imprints on glass with ultraviolet light and high-quality lamination. Scientific, dichroic glass is commercially available and is compatible with glass for fusing, casting, and slumping. Finally, integrating art glass with energy (solar) technologies, fire-rating,

heat-mirror, and other industrial technologies is possible. All the above techniques can be combined in unique configurations.

### 3. How do you collaborate with fabrication partners?

I have worked with fabrication partners since establishing my studio in 1980. It requires at least two or three people to make and install larger projects. Initially craftspeople worked for me, under my supervision, as employees or freelance contractors. In creating large glass projects and installations, I need several people with different areas of specialization. Team work has been the studio practice in stained glass since medieval times.

### 4. At what point did you establish a working relationship with fabrication partners outside your own studio?

I began to work with outside fabrication partners after my commissions became too large to manage in my Toronto studio. After completing some very large projects, I came to the realization that most of my time was being spent managing staff and sourcing materials with little room left for artwork. Initially I collaborated with Sattler Studio in Canada from 1995 to 2003. Since then I have worked primarily with Peters Studios in Paderborn, Germany from 1999 until the present. It is usual for artists in Europe to go to a fabrication studio to make their projects. I have found it a gift to be liberated from the day-to-day business of operating a fabrication studio.

### 5. How did this change your design aesthetic?

Having large kilns and a strong support staff of experienced artisans means few limitations. I have developed a more painterly approach. The move to outside fabrication studios reinforced the artistic direction I was taking, which was to build designs through layering colour and imagery rather than through traditional line drawings.

### 6. How would you define the relationship of your work to industrial production?

As an artist and designer, I have no personal link to industrial production. When industrial processes are needed, such as

Overleaf:  
*Homage to DaVinci*  
solar prototype, airbrushed enamels and screen printing with solar cells and gold leaf  
◇ 2005h

Bottom:  
Studio process with Sarah and Melanie for the St. Marguerite d'Youville *Oculus* window at Peters  
◇ 2002b



Wilhelm Peters

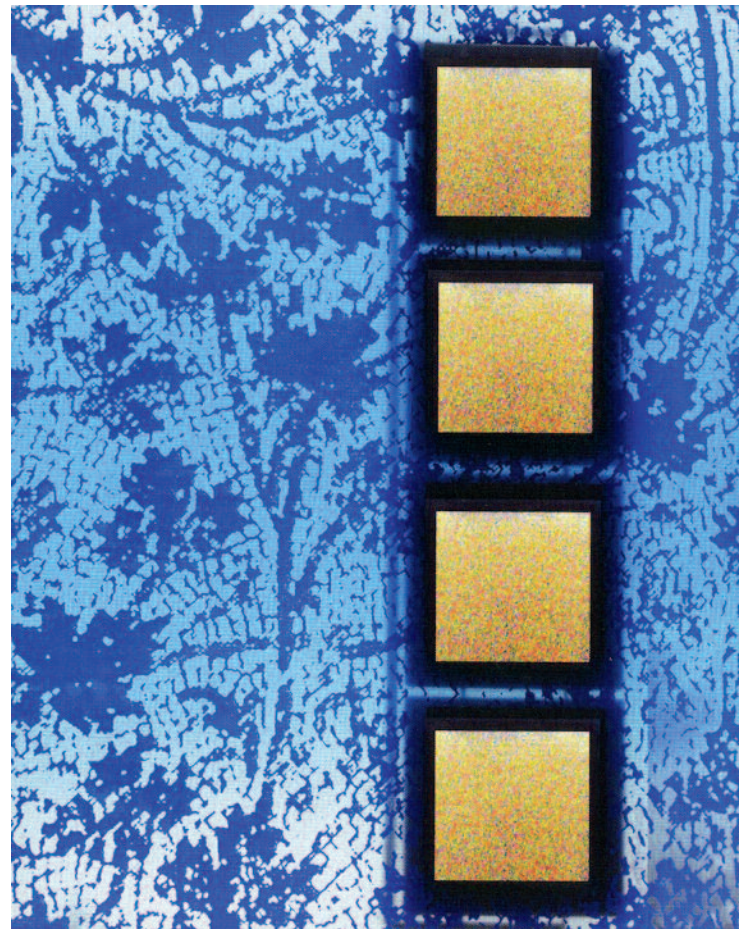




Wilhelm Peters

Top: *Benediction* windows in progress and ready for firing at Peters Studios. ♦ 2013

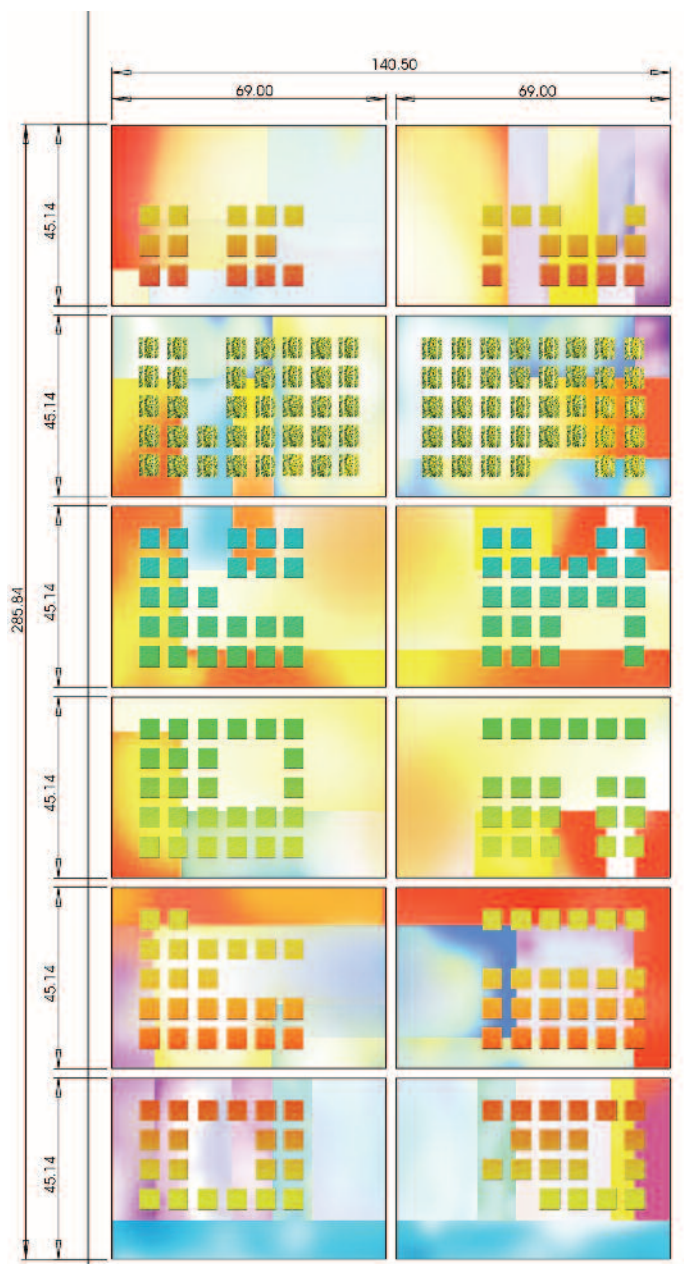
Bottom: *Blue Vine*, solar prototype, airbrushed enamels and screen printing with solar cells and gold leaf. ♦ 2005h



Sarah Hall



*The Science of Light*, preliminary design and concept, Grass Valley Elementary School.  $\diamond$  2009e



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meeting building codes or energy requirements, the fabrication studio makes the arrangements. All the fabrication studios in Germany use industrial partners for tempering, lamination, thermopane manufacture, heat mirror technology, and embedding solar cells. This work is done in specialty industrial facilities rather than at the glass painting studio. Decisions about which technique to use, such as tempering vs lamination, are indicated in the glass specifications on the client contract. Recently at Greenwood College School, I designed for one of the layers to be commercially printed in white enamels. Initially, this was a budget issue but I am very pleased with how it came together with the hand-painted coloured layer of birds.

**7. Where did the idea or prototype for your photovoltaic windows come from? When? What brought you to the creation of this type of work?**

The idea to bring solar into my work came from several sources which all converged within a couple of years. First, my mentor, Ursula Franklin, a physics professor at University of Toronto,

encouraged me to explore connections to solar. Second, I saw many beautiful buildings in Europe created in a technique called Building Integrated Photovoltaic (BIPV) and was convinced it was a great direction for solar. This led me to make connections and take workshops in Canada, the US, and Europe with architects and engineers working in the field of solar and BIPV. The studio in Germany that fabricated my work had collaborated with Klaus Jansen and Christof Erban to make a prototype of art glass embedded with solar cells. They too encouraged me to create solar work. Lastly, and of great importance, I received a Chalmers Arts Fellowship from the Ontario Arts Council, which gave me the time and resources to experiment with the integration of solar collection into my art glass projects.

**8. How have you adapted photovoltaic processes to suit your aesthetic interests?**

I design for solar cells in the same way I compose for a graphic element or pattern. My initial design is sent to the solar engineer who integrates the electrical field and wiring diagram as an additional layer in the design. The wiring can appear strictly functional and almost invisible, such as my project for the Cathedral of the Holy Family, Saskatoon, or it can add an exciting graphic element to the overall composition, seen in my Regent College Wind Tower, Vancouver. Solar projects, which make up only five percent of my studio practice, have brought a rigor to the design process because they require me to incorporate rigid graphic elements. Now I am designing for the new solar nanotechnology which is much more open and fluid. This will bring a further change to my design work for bird-friendly glass.

**9. What hand processes are important to the photovoltaic projects?**

The hand processes I use are the same as in any project. When used as a design element, photovoltaic cells make up only part of the window. There is always a need for hand processes to create the artistic context so that the solar cells can make visual sense within the window. The glass can be hand painted, laminated antique glass, air-brushed, fused, sandblasted, acid-etched, silver stained or screen printed. In the short time I have worked with solar technology, the method of integrating the cells into the art glass has evolved; however, there is always a need for the artistic context around the cells.

**10. How do you respond to the criticism that photovoltaic components are not green or eco-friendly due to the materials and energy intensive processes required for their production?**

I am pleased to have a chance to correct this view as there is no truth in it. The cost of producing solar cells and solar panels is

paid back within four years. They last forty years plus and importantly do not pollute with greenhouse gasses. The technical information to back this up is easily available online. Let's compare this to fossil fuels, which are a one-time use, releasing pollutants into the atmosphere every minute — and the original material is not recoverable or recyclable.

**11. Then there is the question of their limited life-span, whereas traditional stained glass compositions last hundreds of years.**

Regarding solar cells incorporated in art glass installations — these can be reconfigured after forty years with newer technologies or the solar layer separated from the art glass and recycled. Solar technologies will have developed in ways we cannot imagine.

We all love the idea that our stained glass will last for hundreds of years. Sadly, this is no longer the truth of it. I have seen my own and other artists traditional leaded glass projects taken down and replaced within a few years of installation — with a change of owner, purpose, or style.

In my current work I use many techniques, including traditional leaded stained glass. However, this technique does not last hundreds of years unless it is cared for through its lifetime, and periodically rebuilt and renewed. Despite this, windows are vulnerable to countless hazards, including wars, civil unrest, religious “zeal,” changing fashions, and most often — physical neglect. I asked a few restoration studios in Europe what percentage of traditional leaded windows remain. They estimated that what remains is approximately 2% Romanesque, 8-10% Gothic, 20% Baroque, and 35% nineteenth century windows. I think it would be great to bring this question to dozens of stained glass restorers throughout Europe for academic verification.

**12. Has the solar process “caught on”? Are there others in Canada or the USA who are creating analogous work? Is the expense a drawback?**

My work in integrating solar is not a new “studio process.” I am an artist who has created work in collaboration with a solar engineer. A solar engineer is required in the process of making solar panels because the panels must conform to national and local electrical codes and standards. Since it is new technology, the codes and standards have often lagged in North America. Integrated photovoltaics cannot really be considered a craft or studio practice, but rather a collaboration between artist and electrical engineer. Many artists and designers are interested in the ideas and technology. In the US, Peters Studios along with Lynn Goodpasture have made an interesting solar project at the San Jose Library, and Carol Bennett along with Peters have integrated photovoltaics at the Hawaii State Art Museum.

There has been a lot of interest from solar energy companies who want to customize their work and look more attractive. There is also interest from architects and designers. I think my solar projects have greater impact on the solar and architectural world than on the field of stained glass, and this is as it should be. My interest as an artist is to advocate for the values I hold. I have always been interested in creating work that leads us forward, both spiritually and environmentally. Solar art glass is expensive — but the client has a unique art glass window that collects energy.

**13. Why do you think you have been so successful in garnering so many commissions for this type of work, your artistry aside? Why would a client be prepared to spend extra funds?**

I am thankful for the many opportunities that have come my way. It would be accurate to say that I am a focused, curious person, given to making things happen. I am interested in exploring new ways to express my ideas, engage in current environmental issues, and solve design problems. I have been fortunate to find clients who are willing to be “stretched” in terms of their expectations. In our meetings, I make it a point to listen to them and build a sense of shared journey and commitment while trusting that I will create something special for them. Usually the artwork is not what they expected, but rather something that feels “right” for the building and their community. Many innovations come from being faced with challenging and difficult architectural settings and requirements. Early on, I made a commitment to try something new technically in every project.

The solar projects are only five percent of my total work. The cost for solar is like traditionally painted, leaded glass windows of antique glass. I consider solar when it is appropriate from an aesthetic and technical point of view, and I continue to work with all techniques, including painted and leaded antique glass.

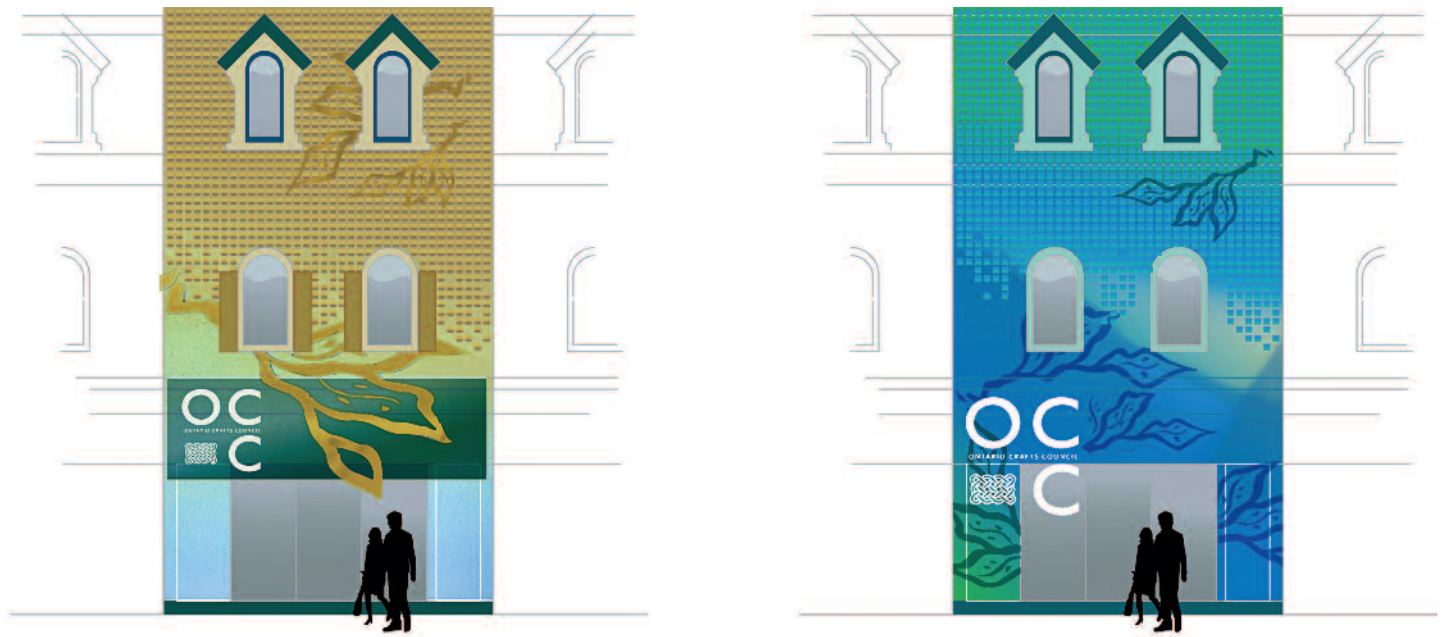
**14. Is solar the appeal of the avant-garde, or something else, in your opinion?**

I don't consider making an effort to care for our environment avant-garde. I think we need to find creative, beautiful, ecological ways of living in the world.

**15. What was the relationship of traditional stained glass with architecture in your early projects? How does this differ in your photovoltaic projects, if at all?**

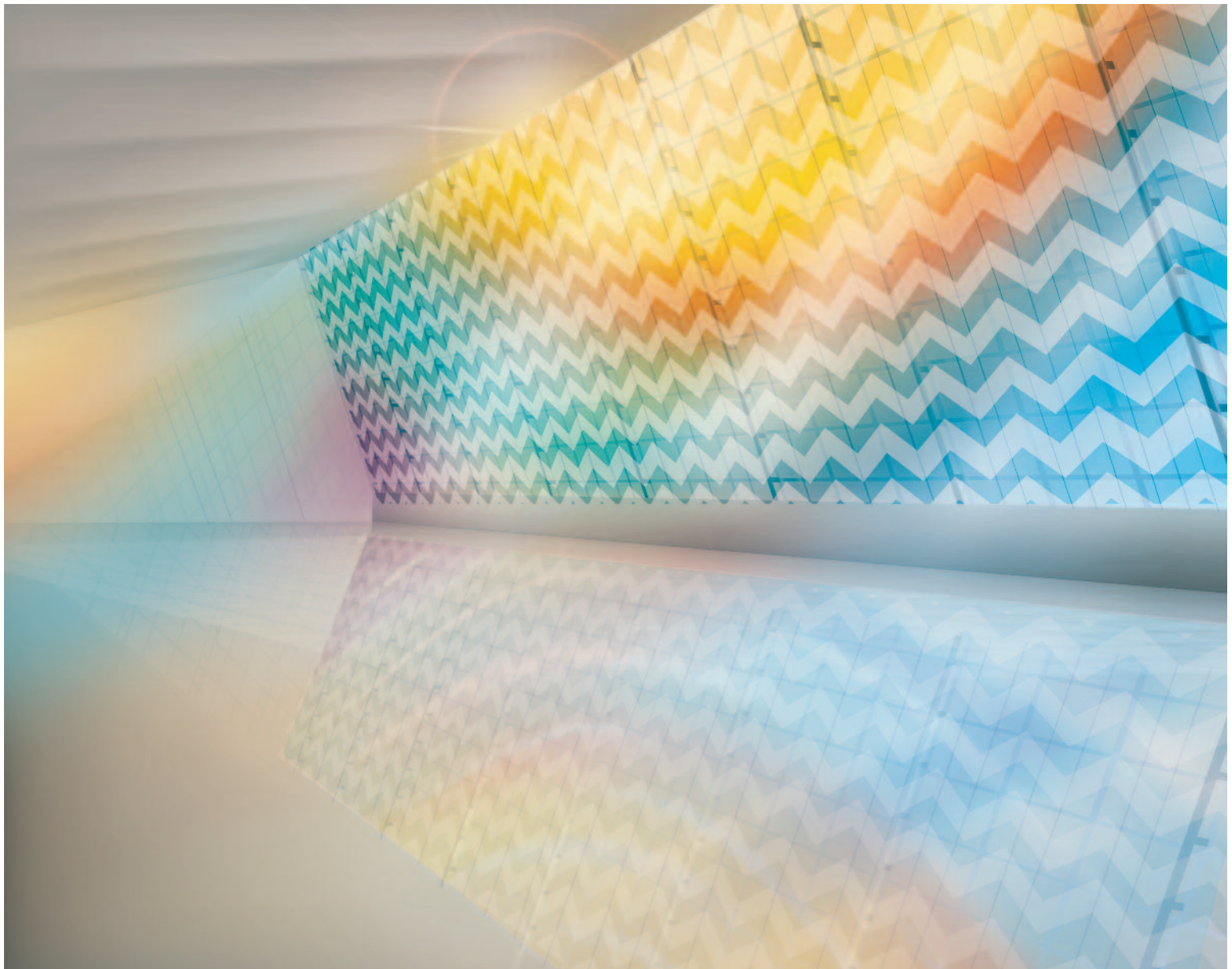
I do not see too much difference between the relationship of my glasswork with architecture in early projects compared to recent photovoltaic projects. I have always been interested in finding the best fit for the glass and light, for the building, and for the clients. These things lead me to the right technique. One factor





Top: Sarah's solar façade retrofit covers an existing façade with an energy collecting building envelope

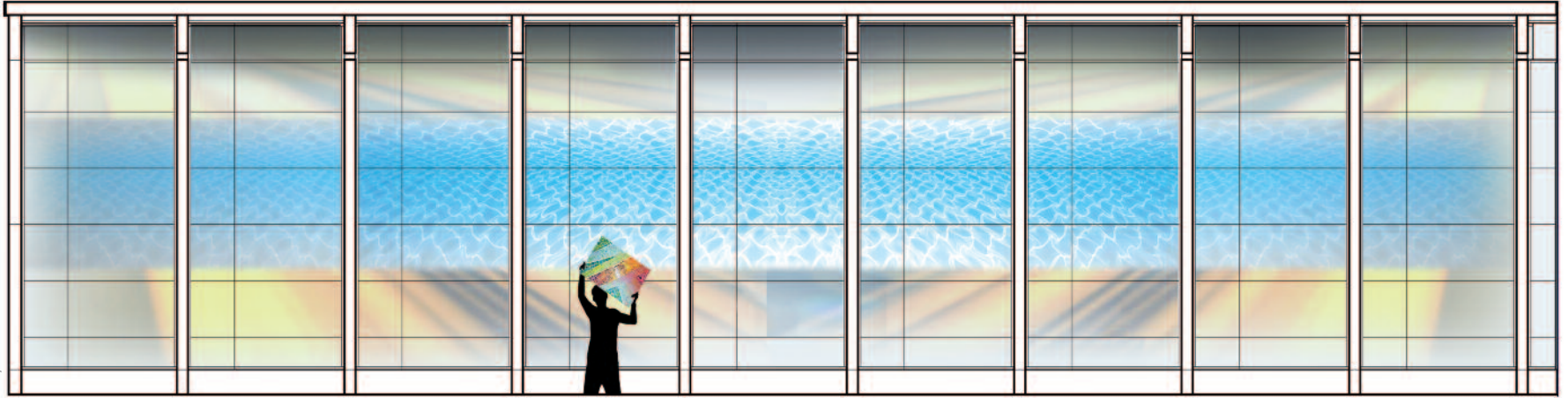
Bottom: Bird-friendly patterns combined with transparent glass which collects solar energy



Sarah Hall

# Sarah Hall Glass Library

Amy Kwan



## Founded by Koen Vanderstukken

in solar work is the orientation of the window to sunlight and whether it will collect enough energy. I also consider if the building will be a good fit for a strong graphic element.

My tools, knowledge, and resources have evolved, and the building industry has changed. An architect's expectations of glasswork in contemporary buildings is no longer the same. For example, the specifications require the art glass to be tempered, laminated, fire rated, and have a specific thickness without variation.

### **16. You have recently been exploring solar bird glass. What can you tell me about this new direction?**

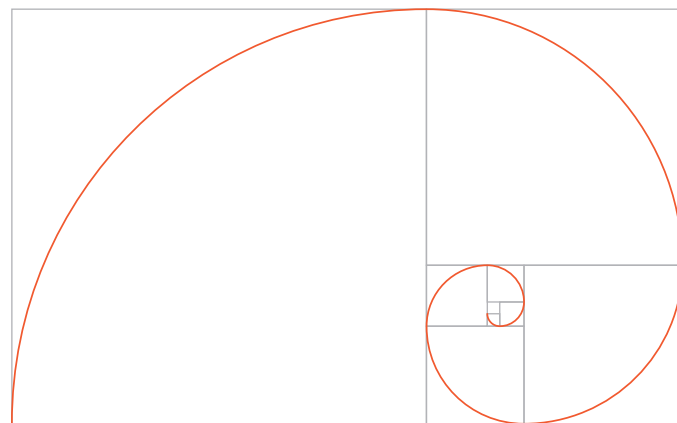
A couple of years ago, Paul Raff, a Toronto architect, mentioned that the solar façade retrofits I had designed for the OCC would stop "the bird problem." I soon learned more about "the bird problem." The reflective quality of glass is the issue – birds perceive the reflected image of the sky as real, and they fly into it. Here in Toronto, about nine million birds die every year by colliding with glass. This statistic staggered me. Most of the new high-rise buildings being constructed are made primarily of glass. I wondered how this problem could be addressed. There is bird-friendly glass of many types being developed and I thought of another idea – to bring together solar and bird-friendly patterns. One could replace the old glass with energy-producing glass that prevents bird collision and is somewhat transparent.

My previous solar installations had all been with multi-crystalline cells that were opaque and would not be appropriate to high-rise offices or condos where people want transparency in the glass. However, there is new solar technology coming onto the market based on nanotechnology. It is lightly coloured and has great advantages: low capital cost of manufacturing set-up,

and a simple, screen-printing process of application which offers abundant, organic materials in a range of transparencies. I am currently working with Peters Studios to create prototypes in this direction.

### **17. You have had a long and inspiring career to date. What's next?**

A new adventure is the *Sarah Hall Glass Library*. The Glass Studio under Koen Vanderstukken at Sheridan College, Oakville, Ontario is creating a "Glass Library" – the first in the world – which will include hundreds of samples related to my technical experiments in glass over the years. This collection will serve as an ongoing, hands-on resource for students and scholars interested in studying stained glass techniques. My glass is returning to the first place I studied. I am delighted with this and thankful to everyone involved.



Kathy Kranias is a ceramic artist, educator, and leading researcher on Canadian post-World War Two architectural art glass. She is a contributor to *SSAC Journal*, *Stained Glass Quarterly*, *Studio Magazine*, and *The Journal of Modern Craft*.