

# What Things May Come

The Third International 3D Print Sculpture Exhibition

The Sarofim School of Fine Arts, Southwestern University

February 4 – March 4, 2015



# What Things May Come

## The Third International Digital Sculpture Art Exhibition

### CURATED BY

Mary Hale Visser and  
Christian Lavigne

Sculptors have been using and experimenting with 3D printing since its inception. In the article "Fluid Borders" noted critic and art historian Christiane Paul defines the 1990's as the decade when digital/virtual computer generated sculpture comes into its own. It is in this decade that Paul makes note of the expanding dialog and the international recognition of INTERSCULPT, a biennial digital sculpture exhibition and symposium. In 1992 the Computers and Sculpture Forum was established to plan for computer-related sessions, demonstrations and exhibitions at sculpture conferences. Its members were sculptors who used the computer to design or create their work. CSF grew to include over 150 members throughout the world. The Forum collaborated with its sister associations in France, Ars Mathematica, and in the United Kingdom, FAST-UK (Fine Art Sculptors and Technology) to stage INTERSCULPT, a global biennial sculpture event. Twenty years later as I curate my fourth international digital sculpture exhibition, I am still amazed to see how the work has progressed. This 37th Brown symposium is the result of my passion with sculpture and a technology that offers new avenues to creative thinking, problem solving and research in many fields.



As sculptor Keith Brown puts it, "the trans physical aspect of the cyber environment provides new possibilities for sculpture and radically changes traditional modes of experience that were previously defined by gravity, scale, and material limitations. Sculptors are now free to build forms that defy natural laws." Artists using this new medium 3D printing have already expanded the concept of space from real to virtual and the form from observing the physical world to visualizing numerical data collections. Others study and capture in solid form the temporal unseen physics of the liquid elements in our world. Some artists visualize the constructs of geometry while others experiment with the illusions of surface imagery upon the human mind. Not only is this technology reshaping sculpture, but it is also changing our understanding of the world around us. Artists are bio printing living sculptures using their own cells, families are designing and printing missing limbs for their children at a fraction of the cost, scientists are bio printing organs and food for our bodies, environmentalists are replacing damaged coral reefs and people by themselves or in groups are printing houses, cars, and musical instruments to name just a tiny fraction of what is being 3D printed today.



The artists presented here include many pioneers in the field, however, these artists were selected because their work demonstrates a new definition of sculptural form, a paradigm shift, and the emergence of a new sculptural aesthetic. Just as the advent of industrial processes changed sculpture in the early part of the 20th century, so too did data acquisition use and 3D printing technology impact contemporary sculpture in the 21st century. As with any new tool the possibilities seem endless, however, it is not the machines themselves, but the quality of the activities that this technology enables that is important. It is the purpose of the artist to comment on these changes and present a visual dialog to the public to consider. In this exhibition you will see work that is innovative and demanding of your attention not because of the process, but because the process has freed the artist from the constraints of traditional limitations in the making of sculptural statements.

—Mary Visser

### SPECIAL THANKS

We are very thankful to Dr. David Bourell of the University of Texas for making this exhibition possible.

## In Memory and Honor of Alexandre Vitkine, 1910–2014



Alexandre Vitkine began his career as an engineer, and then in the 1960's after sharpening his skills in photography he became a master photographer. Early on he formed strong friendships with master photographers such as Robert Doisneau and Willy Ronis among many others. Alexandre developed a very personal style for reducing his imagery to absolute black and white prints with no gray tones. His vision was to convert real scenes into strict graphic abstractions emphasizing shapes by outline rather than forms with shadows. His preference was for the deserted industrial landscape. As a photographer his aim was to simplify his images by focusing on uncluttered forms. He adhered to this aesthetic vision in his future sculptural works. In the mid 60s, he uses his technical knowledge to hack oscilloscopes and television monitors in order to obtain visual signals that he can then photograph. With colored filters in 1967 he created an animated film, frame-by-frame, entitled "Chromophonie" accompanied by a musical composition created by Alain Dubois. In 1968 Vitkine was invited to display his work in the famous exhibition "Cybernetic Serendipity" in London as a pioneer of electronic arts. He continued working in the electronic arts until the late 1980s. Alexandre

invented the concept of "infosculpteur" by using a computer to generate mathematical curves that produced, layer-by-layer, 3-dimensional shapes. He built his early designs using CNC milling machines, first with the help of various partners from schools and labs and then later on his own. Once he mastered the skills necessary to control the CNC process he installed a machine in his own studio. In 1995, wishing to control the entire process, Vitkine wrote his own computer software-drawing program and the program to control the milling machine. Some of his software was also used for additive manufacturing (3D printing) machines.

In 1990 Alexandre met Christian Lavigne in an art & technology show in Paris, and they discovered they had several activities and objectives in common. Noting that digital sculpture was unknown to the artists and public, they decided to create the Ars Mathematica non-profit association for the purpose of educating the public about digital sculpture. By the end of 1992, they had organized the first international exhibition exclusively dedicated to digital sculpture. Then in May 1993 at the Ecole Polytechnique the event became a regular art show under the name of INTERSCULPT. Since this time, Ars



Mathematica has supported and held events to bring artists, engineers and scientists together.

Vitkine is one of the very few French pioneers of digital sculpture who produced his own sculptures and engravings using software that he developed. These sculptural works are a continuation of his formal artistic research toward harmony and simplicity, sparseness and clarity, in order to achieve a kind of universal essence recognizable to by all human beings.

—Christian Lavigne, 2015

# Bruce Beasley

brucebeasley.com

Oakland, California, USA



CORIOLIS V

## BIOGRAPHY

Bruce Beasley is one of the most prominent sculptors in the U.S. In 1962, The Museum of Modern Art in New York acquired one of Beasley's sculptures, making him the youngest artist ever to be included in their permanent collection. In 1963, he won the Purchase Prize in the Paris Biennale, the world's most prestigious international exhibition. Since that time, Beasley has had his sculptures included in the permanent collections of 33 art museums around the world. He has had more than 55 solo exhibitions in the U.S. and abroad, and has been included in hundreds of important group exhibitions. He has represented the U.S. in numerous international Biennale exhibitions and world fairs. Beasley has also created 35 monumental sculpture commissions in the U.S. and abroad, including sculptures for the Beijing Olympic Games and the Shanghai World Expo. He has just completed a large granite sculpture for the city of Palo Alto, California, and currently has a solo exhibition of five large sculptures on the campus of the University of California, Berkeley.

## ARTIST STATEMENT

"I began working with 3D computer modeling in 1987. The issue that drew me to computer modeling was the desire to be able to manipulate and intersect shapes easily and spontaneously, free of the constraints of real material. My background is the direct metal working tradition of sculpture, where the esthetic composition and physical making of the sculpture are one and the same. It felt strange and remote to be composing shapes on the computer instead of directly in metal. Once I learned the rather difficult and complex program, the advantages were overwhelming. Computer modeling allows me the freedom to spontaneously and easily explore and play with shapes, free of gravity and other material considerations. Thus, my new way of working was to separate the composition from the physical making of the sculpture. It was feasible to cast or fabricate the first group of sculptures created this way because they were composed of flat surfaces that the computer could unfold and plot patterns. I had been following the development of 3D printing since the early '90s and, when I started making sculptures with compound curved surfaces,

it became relevant to my own work. I use 3D printing as a way of producing finished sculptures both in bronze and ABS. For me, 3D printing is a logical and necessary extrapolation of computer modeling. Computer modeling gave me freedom from material constraints when conceiving the sculptures and 3D printing has made it possible to bring any of those shapes into the physical world. 3D printing is still in its infancy; build envelopes are too small, materials are too limited, and it is too expensive. However, as these limitations are overcome, it may become the most important tool in the history of sculpture."



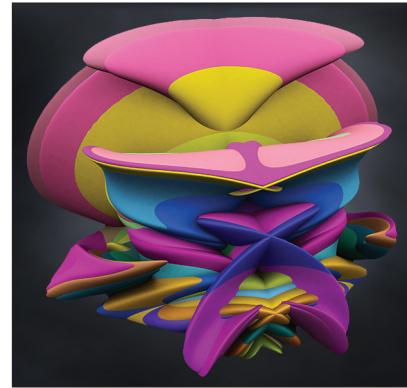
# Keith Brown

[www.art.mmu.ac.uk/profile/kbrown](http://www.art.mmu.ac.uk/profile/kbrown)

Manchester, England

## BIOGRAPHY

Professor Keith Brown is one of the foremost digital sculptors currently working in Europe. He has made regular representations at an international level as a contributor to and organizer of symposia and exhibitions in electronic and digital art. Recently exhibiting in China, Japan, Australia, New Zealand, India, Turkey, the U.S., South Africa, Senegal, France, the Czech Republic, Poland, Germany, Austria and the UK, he has gained international acclaim as a pioneer and leader in his field. Recent venues have been as broad and diverse as the Royal Academy of Arts Summer Exhibition (London) 2002, 2003 and 2005; SIGGRAPH Art Gallery (San Diego, Los Angeles & Boston) 2003, 2004 and 2006; 5th Beijing International Art Biennale, National Art Museum of China 2011; Agents of the 3D Revolution, University of Johannesburg Gallery, 2014; and World Capital of Design, Cape Town South Africa 2013. As Founder and President of Fast-uk (Fine Art Science & Technology in the UK) he has done much to encourage and support digital art at a national and international level with assistance from the Arts Council of England, Manchester City Council, and MIRIAD.



Brown was a postgraduate student at the Royal College of Art from 1972–1975, and for the past 25 years has directed his research and practice from within the digital arena.

## ARTIST STATEMENT

“The focus of my digital sculpture lies mainly with the discovery and realization of new three-dimensional entities, and deals largely with the appropriateness of medium in relation to process. The use of computing technologies is an essential aspect of my creative practice and is indispensable to the conception, content and quality of the artwork. My main concern is with Real Virtuality or Cyberealism rather than Virtual Reality, thus reversing the usual order between the cyber and the real. It is not my intention to emulate reality in a virtual world but instead to explore the many possibilities made available through computing technologies and, where possible, to bring these to a form of manifest actuality, resulting in the production of a new order of object, presenting us with new forms, realities, experiences and meanings in what must be considered a paradigm

shift within the discipline of fine art sculpture. My digital sculptures are born out of the direct manipulation of geometry in a multi-dimensional cyber space where material, as we understand it, does not exist. In the cyber environment, 3D entities may be encouraged to behave in ways not achievable through physical means, being located in an area that exists beyond the imagination and everyday experience. These virtual sculptures, made manifest through 3D printing technology, are grounded in a material form and act as a vehicle which transports us to this strange and wonderful “other place” where unpredictable and surprising events occur. It is as if modeling with light, with pure form, in an environment where physics, matter and energy, materiality and gravity, play no part, freeing form from material constraints, and transcending our given understanding of how material objects behave in the world.”

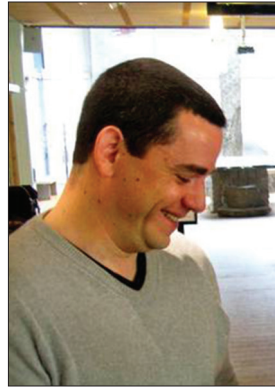
SWEEP



# Jérémie Brunet

[www.shapeways.com/shops/3Dfractals](http://www.shapeways.com/shops/3Dfractals)

Paris, France



## BIOGRAPHY

Jérémie Brunet (1975) lives and works in Paris in the software industry and is a specialist in 3D fractals and 3D printing. As the newest member of the ESMA (European Society for Mathematics and Arts), Jérémie Brunet is recognized for his animated 3D fractals generated by using Mandelbulb 3D software program. Brunet collaborates with software programmers and other artists to produce award-winning images and videos of stunning fractal landscapes. Brunet creates his images and forms by using the 3D software program, "Mandelbulb," with a plug-in by David Makin, Ultra fractal Frederik Slijkerman. Taking advantage of a wide range of 3D printing techniques and materials, he translates these virtual worlds into real-life sculptures and jewels that give life to a new generation of strange yet familiar patterns. His work is appreciated for its originality, innovativeness and graphics quality, in terms of staging and choice of colors. Brunet is internationally recognized for his contribution to 3D fractals animated art. His artwork has been published in several journals, both scientific and artistic, including; "From Relief

to Fractals," published in Scientific American 395, September 2010 by C. Poppe. His work has appeared in numerous art exhibitions and animated short films around the world.

## ARTIST STATEMENT

"When I saw the most famous fractal figure, the 'Mandelbrot set,' it was a two-dimensional graphic image. I became fascinated by the idea of creating a three-dimensional equivalent. In 2009, I became a beta tester for the 3D fractal software applications that I now use to create 3D fractal forms for 3D printing and animations. This software was developed by Jesse and a group of Fractal Forums contributors, based on Daniel White's and Paul Nylander's Mandelbulb work. MB3D formulates dozens of nonlinear equations into an amazing range of fractal objects. The 3D rendering environment includes lighting, color, specularity, depth-of-field, shadow- and glow- effects; all allowing me to have very fine control over the imaging effects. MB3D has a devoted following of users worldwide, with on-line communities where we artists share our creations, as well as fractal

formulas and software tips. All the images are posted on the site and fractal forums; most successful on the DeviantArt.com site. I am interested in the transformations of fractals set to music and moving through space with an emphasis on intense spatial orientation of dizzying zooms and flyovers of the 3D fractals, highlighting their quasi-self-similarity of these fascinating objects and the notion of infinitely small and infinitely large forms occupying space."

QUASI GRAIL



# Brit Bunkley

[www.britbunkley.com](http://www.britbunkley.com)

Wanganui, New Zealand

## BIOGRAPHY

Brit Bunkley is a New Zealand-based artist whose current art practice includes public art, sculpture, the creation and installation of "impossible" moving and still images, and architecture designed using computer 3D modeling, video and image editing programs, with content emphasizing majestic landscapes, human joy and an oblique sense of apocalyptic anxiety tempered with whimsy and irony. Bunkley is represented in many international collections. He has received several grants and fellowships including a Wallace Trust grant in New Zealand; a New York state fellowship (CAPS) grant, a New York State Council on the Arts project grant, a USA National Endowment for the Arts Fellowship and the American Academy Rome Prize Fellowship. His works have appeared around the world in major exhibitions. Recently, he received Special Mention at EVA-Experimental Video Architecture awards, selected by an international jury in 2013, and is currently featured online in the Japanese art magazine "MONTEM." Bunkley has completed a dozen temporary and permanent public art projects including a month-long public screening at



the Oslo Central Station, Oslo Screen Festival, in collaboration with Kunsthall Oslo, Oslo, Norway, autumn 2013.

## ARTIST STATEMENT

"I am intrigued at the intersection of virtual and physical sculpture and the juncture of animation and captured video. The content of the artwork often focuses on an oblique sense of paranoid apocalyptic fear tempered with a sense of whimsy and irony. I have worked with 3D digital sculpture and animation since the early '90s, when I first used 3D software for proposals for public art. By the late '90s, my artwork almost exclusively focused on digital sculpture, virtual public art and 3D animation. In recent years, I have returned to creating physical sculpture, installation and video, of which computer software as well as 2D and 3D digital output continue to be essential methodological tools in the creation of this work. The computer has been a natural vehicle for creating my artwork, not only as a tool for the design and dimensioning of sculpture, but also as a means toward creating virtual sculpture,

photography and digital video. It is my intention that the computer output function by creating and manipulating virtual and actual photorealistic images, video and objects that are convincing and unsettling. Since the late '90s, I have been creating video tableaus that combine 3D renderings with actual footage while unknowingly mining similar territory as AES & F with oblique apocalyptic video installations and single channel screenings that have included the Centre Pompidou, Paris, the Moscow Museum of Modern Art and the White Box in New York, N.Y."

## SEVERAL SINS OF THE YOUNG



# Dan Collins

[www.public.asu.edu/~dan53](http://www.public.asu.edu/~dan53)

Tempe, Arizona, USA



## BIOGRAPHY

Dan Collins joined the School of Art faculty at Arizona State University (ASU) in 1989. He is founding Co-Director of the PRISM lab (a 3D modeling and prototyping facility) and coordinator of the foundation art program (artCore). Collins studied studio art and art history at the University of California, Davis, receiving a Bachelor of Arts degree in 1974. He also holds a Master of Arts degree in art education from Stanford University (1975), a Master of Fine Arts (MFA) in "new forms" and sculpture from UCLA (1984), and a Ph.D. in interdisciplinary humanities from ASU (2009). He has served as president of the board of trustees of the Telluride Institute, a "high altitude think-tank" in the San Juan Mountains of Colorado, since 2008.

## ARTIST STATEMENT

"I draw upon a range of interdisciplinary approaches to art theory and production, including site-specific sculpture, performance, 3D visualization, rapid prototyping and GIS mapping. I situate my work in the gap between the body and technology—between the hand-made and the high-tech. Recent work focuses on novel 3D scanning systems, 3D printing, interactive media, and community mapping."

BETWEEN



# Bathsheba Grossman

[www.bathsheba.com](http://www.bathsheba.com)

Somerville, Massachusetts, USA



## BIOGRAPHY

Bathsheba Grossman began thinking about sculpture in her last year as a mathematics student at Yale, when it was suddenly revealed to her that Erwin Hauer, with whom she had been studying the human figure, was one of the great mathematical sculptors of the 20th century. From the hour that Grossman saw his work—it was mainly minimal surfaces—she was called to the expression of geometry in sculpture. During the following several years she studied metalwork and design at the University of Pennsylvania, stone carving at Pietrasanta, and drawing at the New York Studio School, all while writing software to fund it. In 1997, when Z Corporation and Rhinoceros were both in Beta, Grossman started to work with CAD/CAM, and never looked back: it was the right match for her style. Suddenly the geometrical designs she could see in her mind's eye were real, and her coding skills became object-making skills. For a time, she worked with lost-wax casting of starch-based prints, then with the advent of direct metal printing, she was able to find a market for her designs. Since then, Grossman has surfed the wave of freeform manufacturing

as it has gotten more affordable, gained in quality and variety of materials, and become wildly popular. At first, she was among a tiny group of users doing direct-to-consumer sales, but is now one artist in a large and growing market. For Grossman, it's been a steep rollercoaster at times, but she doesn't feel any change to her artistic destination: 3D printing is still the right medium for what she has in mind, and her plan for the future is simply to continue.

## ARTIST STATEMENT

"I'm a CAD/CAM sculptor, using metal to make shapes. Often, I work with geometry, ranging from purely algorithmic designs to hand-drawn objects with unusual symmetry and topology. Biomorph designs are also in the mix, drawing on the natural symmetries of crystals, microorganisms and simple invertebrate animals. I'm an object maker. That's an odd destination for a digital artist: with all the 21st century resources of sound and motion, sensors and interactivity, ever more sophisticated input and output devices, my favorite special effect is about a pound of steel—in a pinch, two

ounces will do. This format is as limiting, inert and archaic as any high-tech artwork can be. There's no room in the small box of a printer's build bed (and the smaller box of the print volume that is cost-effective for customers), for anything that is not both strong and simple, in the strong mathematical sense of elegance. I'm looking for the bare minimum to create order and interest in space. And if there's an uncanny whisper of life, then I feel the work has gone well."

RYGO

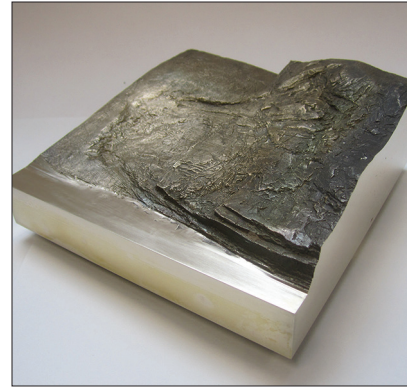
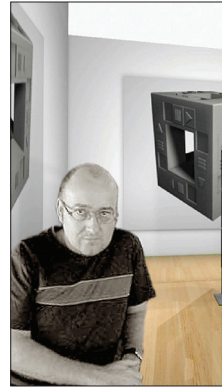




# Ian Gwilt

[www.behance.net/iangwilt](http://www.behance.net/iangwilt)

Sheffield, England



## BIOGRAPHY

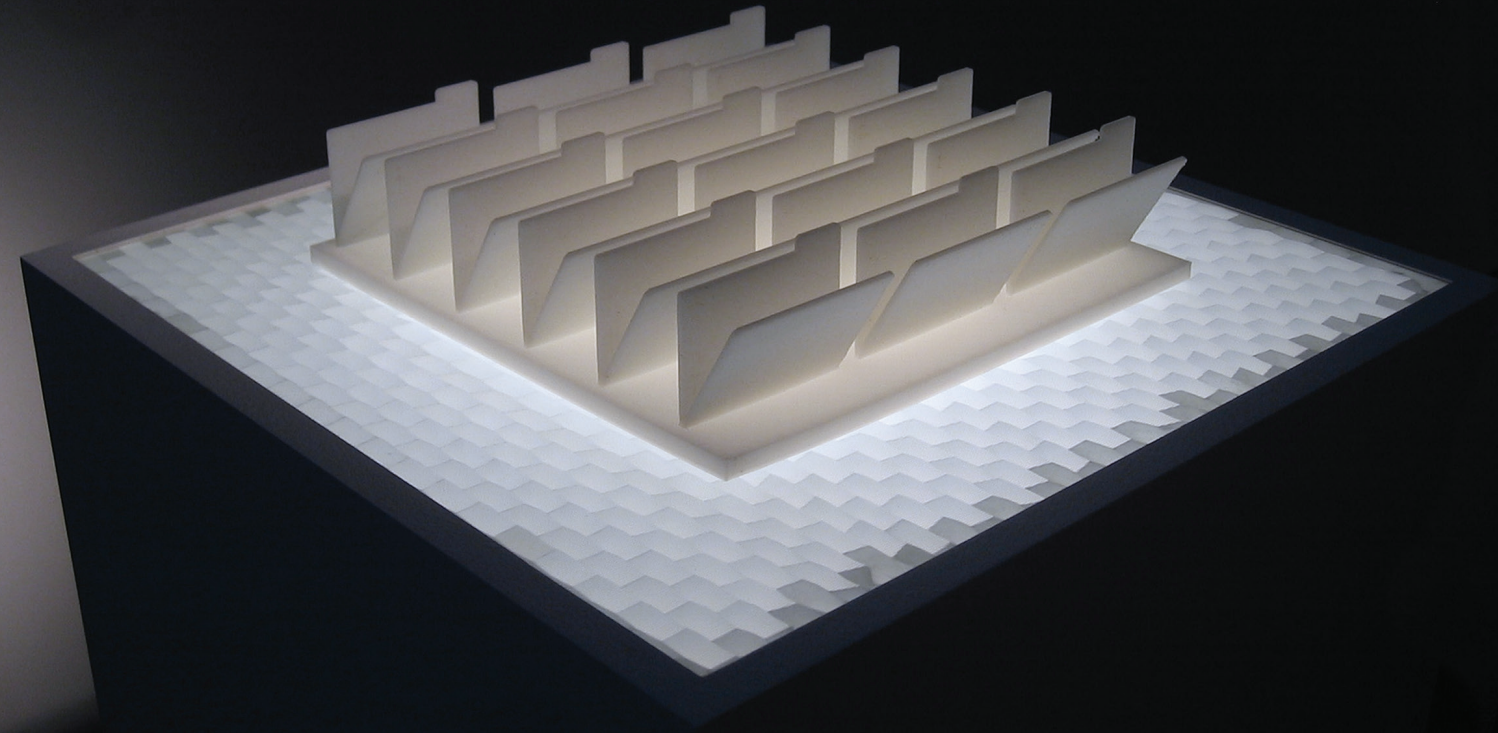
Ian Gwilt is a professor in the Art and Design Research Centre at Sheffield Hallam University, England. He has a Ph.D. from the University of New South Wales, Sydney Australia, which examined the theory and practice of mixed-reality art. He also holds a Master of Arts in Interactive Multimedia, jointly conferred by the University of Balears in Spain, and the Royal College of Art, London, and a B.A. Hons in communication media (educational media design) from Manchester Metropolitan University, England. Originally from the U.K., Gwilt lived and worked in Australia and New Zealand for a number of years where he began to develop his research/practice around augmented reality and the graphical user interface. Other areas of his research include practice and theory into visual communication design and social innovation, information visualization, augmented reality artifacts and locations, interactive installations, the design of hybrid environments and experiences for museum interaction and other educational contexts, including design in the healthcare environment. He is also interested in how we can incorporate visual communication

design practices into interdisciplinary research teams and in better defining design research practices. He is a member of council for the Design Research Society.

## ARTIST STATEMENT

"My work attempts to reflexively use the visual language of the computer graphical user interface to explore the role that digital technologies have taken in our everyday social, cultural and creative environs. I work across a number of media often combining analogue and digital forms including painting, digital print, video, interactive installation and rapid prototype sculptures. I have been making work and writing about digital new media art since the mid 1990s and have exhibited interactive installations and digitally informed artworks at a number of international new media events, galleries and exhibitions."

FOLDERFIELD



# Joshua Harker

[www.joshharker.com](http://www.joshharker.com)

Chicago, Illinois, USA



## BIOGRAPHY

American artist Joshua Harker is considered to be at the crossroads of design and technology, using 3D printing and associated technologies as his medium. He works with "impossible to make," technically complex organic forms. His detailed fretwork has been considered a landmark in the chronology of the 3D printed medium. Harker's fascination with digital sculpture and 3D printing technologies began as a sculptor and designer in the early '90s. In the late '90s he founded a small object design and development firm and served as its president and CEO through 2008. Harker's work has been exhibited internationally and is collected around the world. He holds the #1 most funded sculpture project in Kickstarter history. His work has appeared in many major publications and press worldwide.

## ARTIST STATEMENT

"My art is about pushing the limits of form... an exploration into what can be made and how to accomplish it. I incorporate digital tools, software, and technology in my work, not only because of its utter necessity in the forms I make but also because I feel absolutely compelled to make art with it, to humanize the inhuman as we've done with stone, clay, metal and wood... digital data as medium, computer as chisel, and 3D printer as forge. My art touches on abstract neo-surrealism and is invariably contemporary. Stemming from 2D linear automatism explorations (pioneered by André Masson and practiced notably by Miró, Breton, Dalí, Arp, and Picasso), my "Tangle" series are intended to interpret and share forms evident in the mind's eye but that cannot otherwise be described. My intent is to explore and give form to the architecture of the imagination. I have begun to apply this practice to representative forms. The linear pattern work is an exploration of the 3-dimensional surface giving a new identity to the shape and inviting the viewer to discover the form through the gentle visual lead of the

pattern. I am currently bridging my 2D and 3D work via projection mapping my images and animations onto my sculptures in large-scale live installations. Bolstered by the advent of sculptural software, 3D printing technologies and material engineering, my visions can now be realized sculpturally in archival materials. This boon of technology is a revolutionary time for the arts and one, which will be boldly marked in history. I am honored to be considered one of the pioneers in this medium."

CRANIA-ANATOMICA-  
FILIGRE-BINARY



# Paul Higham

[www.datasculpture.net](http://www.datasculpture.net)

Alfred, New York, USA



## BIOGRAPHY

Paul Higham is an internationally recognized progenitor of 'DataSculpture,' working with virtual sculpture and 3D print technologies in the fine arts for more than 30 years. He studied at Liverpool Art School in the early '70s and went on to study video, painting and sculpture at Goldsmiths, University of London. During Higham's time at Goldsmiths, his conceptual works specified autonomous domain states that became sculptural schemas, and by the '80s, he was able to make these domain states truly "operational" through computation. His endeavor has remained consistent to propagate new forms of art based on self-organizing theories of artificial life. From 1985–87 he became a resident at the Madhyamaka Tibetan Buddhist Monastery, where he studied for the Geshe Degree (Lo-Rig) in "Mind and Cognition," which has directly influenced the current work in his "Thought Forms" series. Higham has carried out advanced research residencies at the University of Minnesota in 3D printing and V.R. medical visualization labs at the MVS Mayo Clinic Immersive Haptic Laparoscopy (remote surgery), utilizing haptic force feedback

technologies, and spent three years at the "Human Machine Design Lab" as resident artist, building neural interfaces and data gloves. This is when he developed "DATA SCULPTURE," using information theory, heuristics and real-time data mining to create emergent forms. His works are in many private collections and museums around the world.

## ARTIST STATEMENT

"Thought Forms" is a new series of 'Data Sculpture' generated by brain lobe activity transformed into 3D volumetric form using 3D print technology. It has always been a central philosophical question as to when and how a thought becomes an action. These works are representations of emergent thought that examine the relationship between the human thought and the machine as 'mind reader.' For example in a 'thought crime,' the action may be attributed before the act. Like a photographic plate the BMI machine has the potential to expose the trajectory of human thought process. To produce these works, I built a custom 'Brain Machine Interface' which reads activity in

the lobes of the brain; these 'brain waves' are parsed into numbers and these numbers form a matrix, which can be read by the computer to generate form. The initial idea for this series of work began during my research in the 'Human Machine Design Lab' at the University of Minnesota in the mid-nineties. At this time I was investigating the question of pre-cognitive ethics of 'mind reading' and the heuristics of 'neurolaw.' It also has a historical resonance with the work of George Booles, "Laws of Thought" 1854 and "Thought Forms" by Annie Bessant and C W Leadbetter, 1901; who explored and illuminated the poesis of thought lending intention a fidelity; their aim was to fenestrate a visible model of intent. 'From simple conditional rules complex forms emerge.'

THOUGHT FORM: FLAMING  
DESCENT INTO MANIFOLD LIES



# James Hutchinson

[www.jameshutchinson.org](http://www.jameshutchinson.org)

Whitleybay, England



## BIOGRAPHY

James Hutchinson is a senior lecturer in fine arts at the University of Sunderland, England. He was born in 1968 in London and graduated in painting from Chelsea College of Art and Design (1990) and in fine art printmaking from the Royal College of Art (1998). Hutchinson's research sits in the territory defined as 'digital.' His output has origins in the physical processes of drawing, painting and printmaking. His preference is to draw with a mobile phone or construct 'sculpture and objects' through the use of appropriate software. He has also taken imagery from digital sources into the physical world, through commissioned work in schools, businesses and exhibitions both national and international. Hutchinson's work has appeared in the following exhibitions: 'Un equilibrium' System Gallery Newcastle, 'Dot/hair': Painting Sculpture Mobile Priestman Gallery Sunderland, 'Bad 3D' Assises Européenne de la Fabrication Additive (expo + confs) : du 24 au 26 juin à l'Ecole Centrale Paris, 'House of ears' 3d Print IS2013 Corte Corsica 'Goed8b' Garden of earthly delights' Digioplasty Anaheim California Siggraph Conference, 'Aliene', 'Monolith 5', '1004da' and

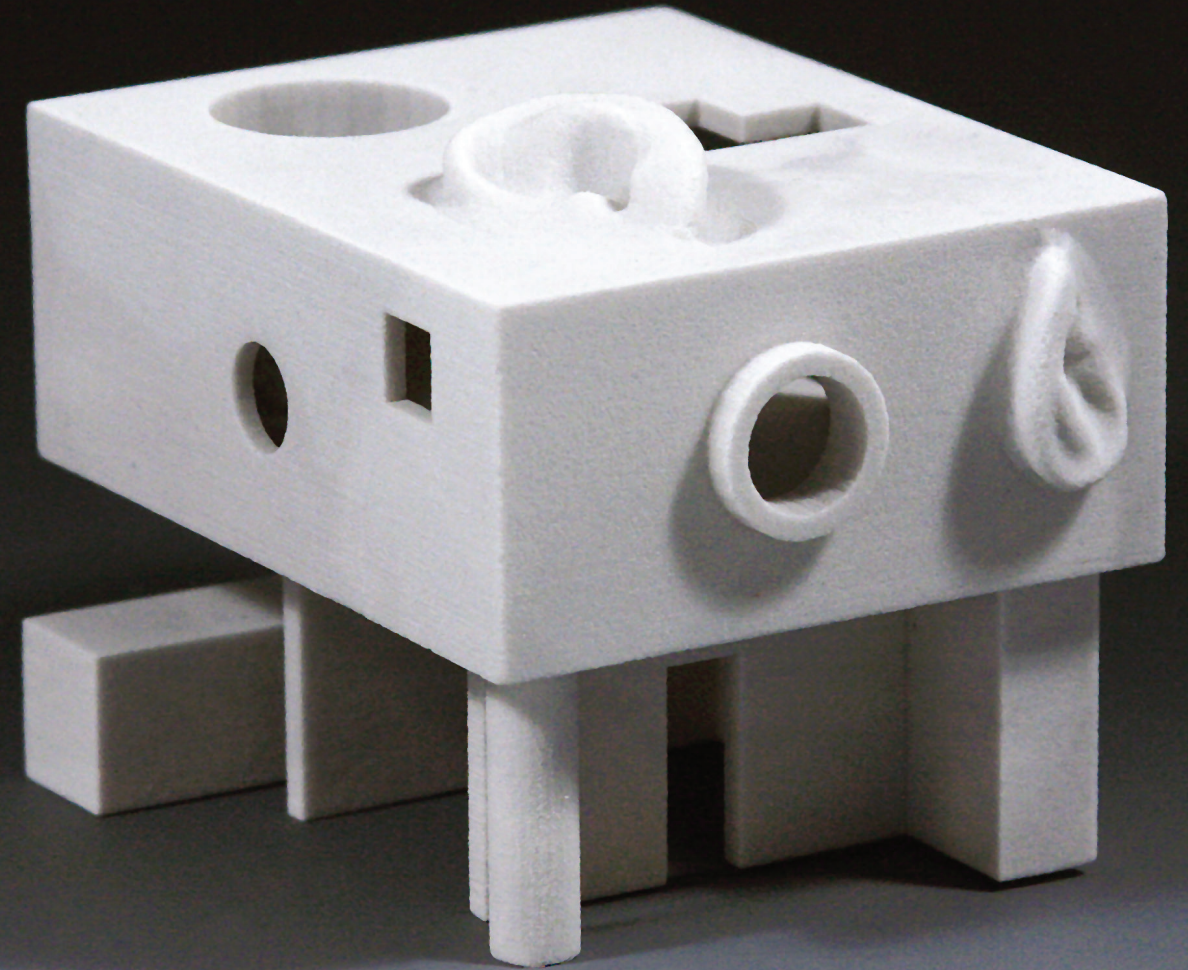
'Face'. 3D Prints, abs. IS2013 Paris Ecole Centrale Paris F, 'Move 2' Bagist VJ set (H+M) MovingArtBox Wuppertal D, 'If you touch me I will fall': 3D Print ABS Eye Hand Mind: India Habitat Centre Delhi, Up coming 'social space' indoor billboards Priestman Gallery Sunderland IPBN14 partner, 'Towards a new Brutalism' 3D print 'unrestrainedly fun voids' Priestman Gallery Sunderland, 'GB1' DVD 'Salonely' Embassy Gallery Edinburgh.

## ARTIST STATEMENT

"My artwork is the result of an all encompassing obsession with drawing and its application to painting, sculpture, digital print and performance. Taking inspiration from the ambulant JMW Turner, I use mobile technology to facilitate drawing on the move. Anywhere can be my studio, though predominantly the digital work takes place on the metro traveling between Newcastle and Sunderland. I take the view that inspiration can strike in the most banal of places, so having a mobile handy allows me to realize an image before it disappears. While embracing mobile digital media, my work

is transmogrified into traditional media, both in my studio and virtually within cutting edge computer technology. My work begins from a simple starting point; the pixel, the line, the cube, a text or found object, and undergoes various transformations. Using a leather sofa cover for the performance 'Klippen Man', I recreated a seminal Joseph Beuys performance, Coyote (without the Coyote), and dissected the leather cover to use as a surface to paint images onto. It was inspired both by art history and personal 'Handy' drawings for which I draw upon a bank of images from magazines, films and art, comic strips and children's television. It is a process that can be seen as both primeval and alchemical. The outcomes are presented at Unit24: a selection of recent paintings, digital prints, animations and sculptures."

## THE HOUSE OF EARS



# Christian Lavigne

[www.arsmathematica.org](http://www.arsmathematica.org)

Paris, France



## BIOGRAPHY

Christian Lavigne developed a personal poetical aesthetic universe based on mythologies and symbols. For more than 30 years, he used computers, NC devices or (since 1993) 3D printers, and is now well-known as a pioneer in digital sculpture. He coined the words robosculture (1988) and cybersculpture (1995). Lavigne has exhibited his works in Europe, North America, China, Australia, New Zealand and West Africa. With Alexandre Vitkine, he created Ars Mathematica of Paris, France, which has organized the worldwide computer sculpture biennial Intersculpt since 1995 and numerous events related to art and science, among them the WEB CAST—Café des Arts des Sciences et des Techniques—co-led by Lavigne and Simon Diner. He also created the Toilemetisse Association, for the meeting of northern and southern cultures. Currently, Lavigne is collaborating with Mary Visser of Southwestern University, Georgetown, Texas, to write the first book on the history of digital sculpture and its pioneers, with the working title, "The History of Cybersculpture," which will be officially announced during the 37th Brown

Symposium held in 2015 at Southwestern University and titled "What Things May Come: 3D Printing in the Fine Arts and Sciences."

## ARTIST STATEMENT

"My main purpose is to promote a new renaissance in the reunion of art, poetry, science and technology. I first approached the arts as a poet who enjoyed exploring 'distant cultures.' I became a painter and a sculptor because I needed to write poetry in 2D and 3D. My scientific background and lack of formal training in the arts allowed me to use computers to design and create. I see no difference between virtual worlds and physical worlds as one is matter and the other is light and both enter the mind. The digital arts are rooted in the material, and cybersculpture doesn't forget the body! However just using this technology is does not make one an artist. An artist must give the work meaning. Too many people are following the latest technologies that excite the public without giving true meaning to their work. The dignity of the artist is to be honest and authentic while trying to transcend the reality. Our true strength is

to succeed in surpassing the present and our personal situation to reach the foundations of the human condition. We must be vigilant about freedom of expression and human rights. We have in our hands the most powerful scepter against the obscurantism: the culture. It would be a crime to use it with negligence and superficiality. Beyond the geographical or the temporal frontiers, the poet, the artist, is one human speaking to another human about life and joy, death and sadness. I'm in favor of a transcendental, sacred and agnostic art. We do not need anyone's permission, as all tools are good that move, arouse and free the human mind, in a fraternal perspective."

QUAND LA CITE N'A PAS DE PORTE,  
MÊME LE PRINCE NE PEUT Y ENTRER,  
MÊME LE PRINCE NE PEUT EN SORTIR.



# Charles Morris

[www.southwestern.edu/morris](http://www.southwestern.edu/morris)

Georgetown, Texas, USA

## BIOGRAPHY

Charles Morris graduated with a Bachelor of Fine Arts degree in Sculpture from Southwestern University. Charles has constructed many large-scale works in metal and wood. He uses 3D modeling software to enable him to create precise duplicates of each form. This allows him to arrange the work in any direction creating the dynamic path necessary to make the work appear to be moving. Charles has exhibited his work in numerous juried and invitational exhibitions. He was awarded Southwestern University's King Creativity Grant to design and build 3 large-scale permanent sculptures in welded steel.

## ARTIST STATEMENT

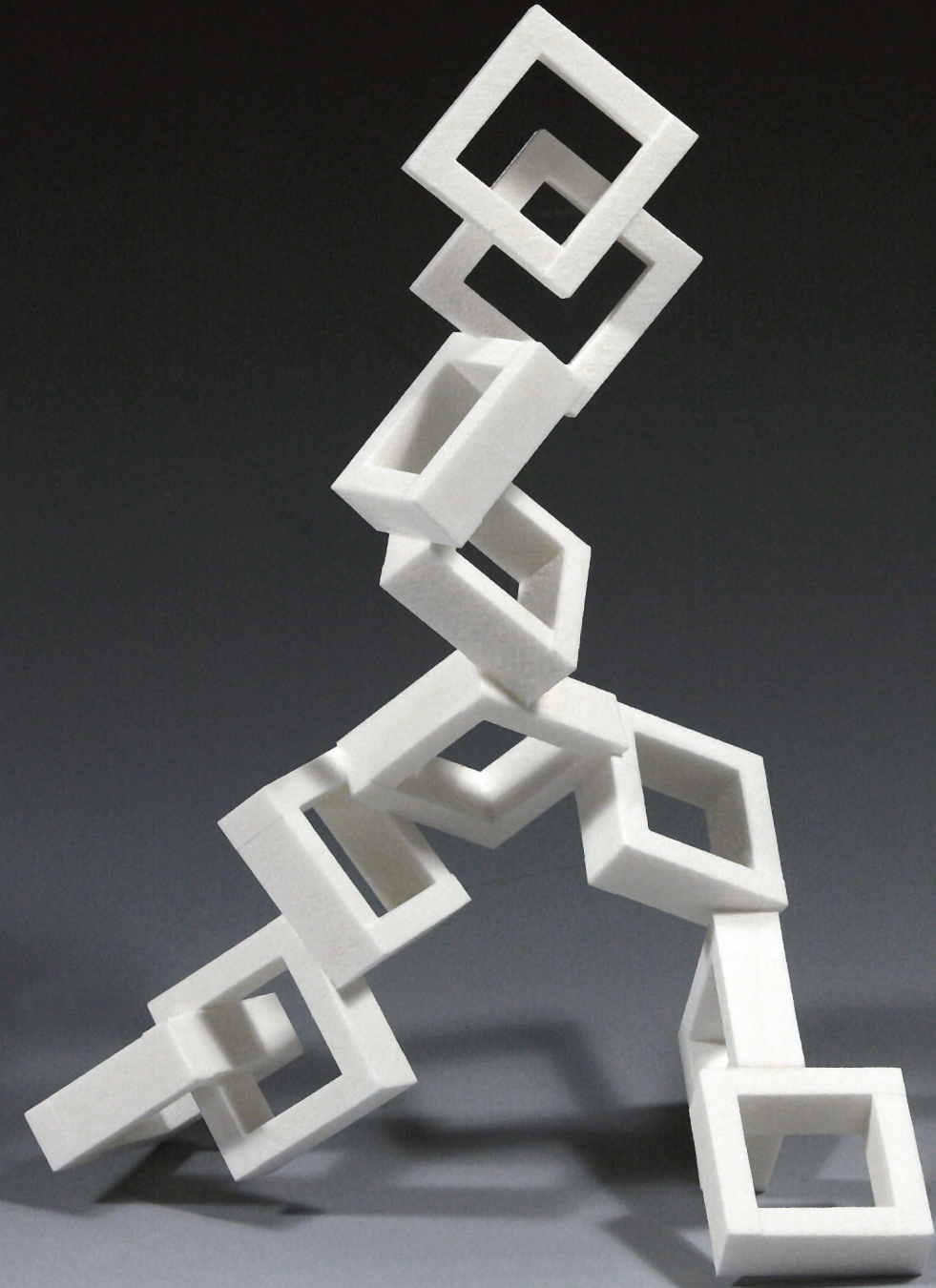
"Art is a device for understanding our existence; it gives us the mechanisms to help us understand and see further into the various worlds we humans create. It is a way of restructuring our reality, allowing us to investigate the inner elements in order to see beyond our immediate experience. Each work answers the mind quietly as we carefully explore the way forms follow meaning, and relate to our experiences. We



open the door to review our own consciousness and listen to new ideas with our eyes. Receiving these ideas breaks the constraints of language, allowing for the interpretation to be solely with the viewer's perception of what they see. In my series 'One Of Many' I have employed two very different and opposing theories in sculpture, static geometric forms and quick organic movement, and hopefully have created a new path between them for the viewer. I have long admired the artwork and theories of minimalist sculptors Donald Judd, Carl Andre, and Sol LeWitt. Judd and other minimalists created sculptures in which the physical properties of space, scale and materials were developed as entities with their own meanings gathered from their visual properties, rather than as a stand in for human experience. 'A shape, a volume, a color, a surface is something itself,' Judd wrote. 'It shouldn't be concealed as part of a fairly different whole.' (*New York Times*, 1964) I am fascinated by these minimalists of the 1960s and 70s, especially those who managed to reduce their work down to one simple unit repeated along a line of movement while still

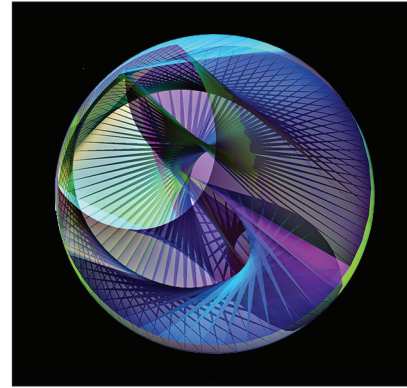
managing to create a strong dynamic emphasis in their work. I use computer 3D modeling software to design the work and then fabricate the forms using a 3D printer. Though the parts are geometric and follow a common pattern, the expression of these parts is highly complex and organic. The 'statement' then comes from the chosen arrangement of these individual parts into an organic line of movement. In terms of size and finish, the shapes themselves appear exactly the same. The creation of the shapes in this way makes for a sculpture made up of unit forms; each unit is the same but the complex structures themselves are arranged according to the movement required for a sense of upward flight or downward collapse. I like opposing the flow of the movement as it creates a sense of tension and dynamic emphasis to the whole structure. The appearance of unbalance is difficult to achieve because it is important to have the structure be physically centered in order to stand, and yet having a support system would take away the illusion of defying gravity."

ONE OF MANY



# Salvatore Musumeci

Catania, Italy



## BIOGRAPHY

Salvatore Musumeci was born in Lentini (Siracusa) Italy in 1942. He earned a degree in physics. Fond of abstract art and of sculpture in particular, he created his first sculptures using traditional tools. When IBM introduced personal computers with color screen, Musumeci began creating computer art, joining his scientific knowledge and his passion for art. In 1985, he had already created software able to give origin to different types of abstract and endlessly changeable images in movement (see N.° 2 of "Leonard" Journal 1986 MIT Press). The single images he now creates are used as background for musical and poetical events. Fifty of them were published in 2009 in a book of images and poems ("Boschi di vetro"). In 1995, Musumeci began creating virtual sculptures, but didn't know of the existence of 3D printers or of exhibitions of digital sculptures; only in 2004 did he get in touch with Christian Lavigne of Intersculpt. In 2005, Musumeci was the only Italian artist invited to take part in Intersculpt (Paris and Nancy), and in the competition was classified second (VRW category). In 2006, he exhibited some of his sculptures at the Fête

de la Science AIP-Primeca (Lorraine, France), and at Catania University (Italy). He took part in Intersculpt 2007 at ENSAM in Paris, Intersculpt 2009 at Metz, 2011 and 2013 (France). Some of his works are at the telesculpture Gallery of Prism Lab at Arizona State University (USA) and at DAAP of Cincinnati University (USA). In Italy, his sculptures and/or images have been shown at the Expò of Bari, in Ferrara, in Laveno (Varese) at the Laboratorio Nazionale del Sud, at Museo Diocesano of Catania, and many other places.

## ARTIST STATEMENT

"When IBM introduced its first personal computers with a color screen, I began to create color computer art, combining my scientific and artistic interests. At first, I created endlessly changeable abstract images in movement, then I began creating single images, exploiting the possibilities computer-driven data offered me to reach the level of perfection of transparent overlays impossible to be obtained in painting. I create color images to be projected and used as backgrounds for musical and poetical events. I began projecting digital sculptures as soon

as new computers and software gave me the possibility to do works difficult or impossible to realize before. I use the forms and colors abstractly as they are to represent the movement and shapes of living abstract forms. They have a strong impact on the subconscious mind expressing emotions and conveying sensations impossible to communicate through words. I exploit, above all, the mathematics intrinsic in the CAD programs in order to obtain precision of lines and perfection of shapes that could never be obtained with traditional tools. I prefer not to work in one style only, but I am always looking for new shapes and new expressive languages. My research still aims at fulfilling my inner need of beauty and perfection through the creation of universal forms, both in the field of sculpture and graphic art, connected to careful color research. In my works, I try to create universal shapes not derived from 'abstraction' of reality but from free imagination. I try to express beauty, harmony and formal perfection and I hope in the possibility of art to rediscover beauty in its formal and ethical value."

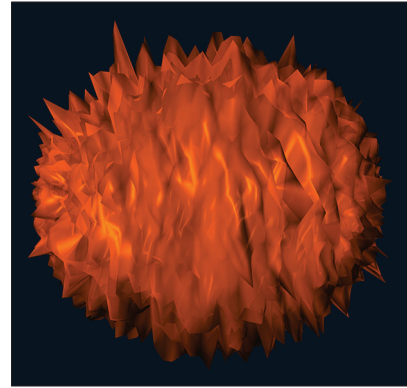
FLUID



# Mary Bates Neubauer

[www.public.asu.edu/~mbates](http://www.public.asu.edu/~mbates)

Tempe, Arizona, USA



## BIOGRAPHY

Mary Neubauer has shown her numerically driven sculptures and prints widely; they are in a number of public and private collections. She has also completed many public art projects involving light and sound in the western states. Her sculptures and digital images have appeared in national and international exhibitions in New York, Paris, Beijing, New Delhi, Adelaide and Queensland, Australia. Working at the intersection of art and science, Neubauer exhibits with organizations including Ars Mathematica/ Intersculpt, TeleSculpture, and Art-Science Collaborations, Inc. She has been a visiting artist at the American Academy in Rome, a Fulbright Fellow in Cambridge, England, and a Ford Fellow at Indiana University, Bloomington. Recent residencies include the Anderson Ranch Center for the Arts, the Tyrone Guthrie Center at Annaghmakerrig, Ireland, the Vermont Studio Center, the John Michael Kohler Arts and Industry Residency at the Kohler Foundry, and the Serde Residency in Latvia. In summer 2014, she will participate in Garfagnana Innovazione, a digital stone-carving workshop in Tuscany. Neubauer is a professor of sculpture at the

Herberger Institute for Design and the Arts at Arizona State University, where she is involved in the Partnership for Spatial Modeling and serves as an affiliate to Arts, Media and Engineering.

## ARTIST STATEMENT

"My recent sculptures, prints and public artworks use information obtained through digital and numerical processes to create visual imagery. Illuminated photograms, laser-scanned images, animations, and rapid prototypes are combined with more traditional casting and replication techniques in artworks that address the natural world as well as the metropolitan environments in which many of us now live. I am interested in contemporary science and its data-gathering methods. My artworks take a new and highly visual look at constantly streaming information about our surroundings. I believe that scientific, numerical and technical data may be interpreted in a visually compelling manner, and that these new visualizations can aid in a deeper understanding of the world, including its long-term geophysical transformations, as well as its daily cycles and rhythms of growth

and change. The surfaces and translucency of my sculptural work retains the touch of the artist's hand and reveals the artifacts of the digital processes through which it has been taken, such as layering, texturing and rasterization. Recent research into the visual transcription of numerical data streams involves collecting historical and near-real-time statistics from the various instruments that are constantly recording details of our surroundings, such as climate, solar activity, water levels, traffic flow, energy expenditure and population flux. This type of inside information can give us a new view of the complexity of our natural and urban environments as functioning entities with hidden, and fascinating, lives of their own."

DUCTILE IRON ELONGATION  
FOR TEXAS





# Rinus Roelofs

[www.rinusroelofs.nl](http://www.rinusroelofs.nl)

Hengelo, The Netherlands



## HELICAL HOLES

### BIOGRAPHY

Rinus Roelofs was born in 1954 in the Netherlands and attended the AKI School of Arts and the University of Twente, where he received a degree in applied mathematics. His work has been presented in exhibitions around the world in places such as the Mathematikum, Ecken and Kanten in Giessen Germany in 2014, the Leonardo + Mathematics in the Hague, East + West in Slovakia, the Geometricka Abstrakcia in Bremen, Germany, at the University of Bremen. He has exhibited in the U.S. in the Outdoor Sculpture in Atlanta, Georgia; the Materia in Amsterdam; the University of Richmond in Virginia; in Tuleda, Spain, for the Metamorphosis exhibit; in Pamplona, Spain, at the Planetario de Pamplona; in Metz in France; and in the exhibit Unfolding New Dimensions at the Louisiana Museum of Modern Art in Denmark to name a few. His work has appeared in many scientific and art publications. A selected few of his articles published are: "The Discovery of a New Series of Uniform Polyhedra – Bridges 2013, Enschede, Proceedings, Weaving with Concrete—Hyperseeing 2013, Bournemouth, GB, Splitting Tilings—Bridges 2012, Towson,

Baltimore, USA, Proceedings, A Mistake in a Drawing by Leonardo da Vinci, Math Art Summit 2012, Brussels, , Restruimte (Remaining Space)—Qua Art Qua Science, 2011, Another way of Weaving—Bridges 2011, Coimbra, Proceedings, About Weaving and Helical Holes—Bridges 2010, Pecs, Non-flat tiling's with flat tiles—Bridges 2009, About Leonardo Grids—Nexus Network Journal 2008, Connected Holes, about Structures—Qua Art Qua Science 2008, Oskar Reutersvard & Rinus Roelofs—Ars et Mathesis 2007, Book Morphological Notes—Int. Journal of Space Structures 2007, Volume 22.

### ARTIST STATEMENT

"The main subject of my art is my fascination with mathematical structures. Mathematical structures can be found all around us. We can see them everywhere in our daily lives. The use of these structures as visual forms is so common that we don't even see them as mathematics. By studying the properties of these structures, and especially the relation between the different structures, can bring up questions to explore their use in space. Questions that can

be the start of interesting artistic explorations. 'Helical Holes' is one of the results that came out investigating weaving structures. For weaving several layers through each other you need holes in each of the layers. Holes with a certain shape. But what if you try to use strange shapes as, for instance, helical holes? The resulting objects are made of one surface only. Artistic explorations of this kind start with trying to understand what you see. Solving those questions often leads to new ideas. Since I use the computer as my main sketchbook, these ideas come to reality first as a picture on the screen. From a rendered picture, I decide whether it is to become an animation or a 3D physical model made by the use of CNC-milling, laser cutting or 3D printing. There are many options, but it is all based on my fascination about mathematical structures."



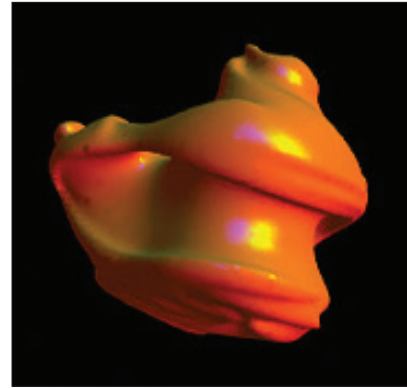
# Patrick Saint-Jean

[www.patrick.saintjean.free.fr](http://www.patrick.saintjean.free.fr)

Paris, France

## BIOGRAPHY

Patrick Saint Jean is a professor in digital design of ENSC, doctor of biology (BME), and engineer of computer-electronic-automatics. He is an artist, a writer, and a pioneer in computer science and the arts. Saint Jean is the General Secretary of Ars Mathematica, a world wide organization devoted to promoting the digital 3D arts. He was also President of Paris ACM Siggraph, professional and student chapter (1995–2005). His research was in musical sound design using computer instruments (UPIC), and developed a digitized system for French composer Iannis Xenakis (1922–2001). Saint Jean carries patents in France and the U.S. on devices to create digital sounds. In 1993, he was involved in designing a new generation of amphitheatres for immersion and interaction with new digital technologies for 3D expression and navigation. He also worked on designs for multimedia concepts (PolyAgogic CyberSpace) with AI-engine, based upon on his own mathematical model (Transcombinatory and Pretopological Quantum Relational Texturologies). He is a professor at the Ecole normale supérieure de Cachan



(ENS Cachan), a prestigious public institution of higher education and research founded in 1912. It is one of the major French Grandes Écoles, which are considered the pinnacle of French higher education with the main mission being to educate world-class academics.

## ARTIST STATEMENT

“3D printing in the arts for me began in the early ‘80s, when I developed RobotCult for cell culture, a RobotPaint device that allowed a robot to paint the surface following the digital hand of a robot. I also developed the RobotSculpt by redesigning a small milling machine to follow digital data for small-scale models. In the ‘90s, I programmed an A3 digital 2D printer to print 3D forms. From 2006, I have collaborated with Christian Lavigne on new 3D printers and 3D printing methods and processes. My research into mathematical spaces (connect with the standard and classical one (Topology and Quantum Physics), is based on pretopological texture, sets theory and category theory, to find a more expressive space for the human world. But for me, matters and materials are

concrete-abstract-virtual, and matter-energy-information that have forms and can be modeled using computer software (math-model) and 3D printing. My purpose is to show the complexity of human relations as subtle interlaced wave functions. I translate these relationships from database to 3D virtual models using both 2D and 3D images, as well as 3D interactive spaces. This information is then 3D-printed as objects in crystal and plastic-materials.”

QUANTUM BIOLOGIQUE



# Alvin Sher

[www.alvinsher.net](http://www.alvinsher.net)

New York, New York, USA



## BIOGRAPHY

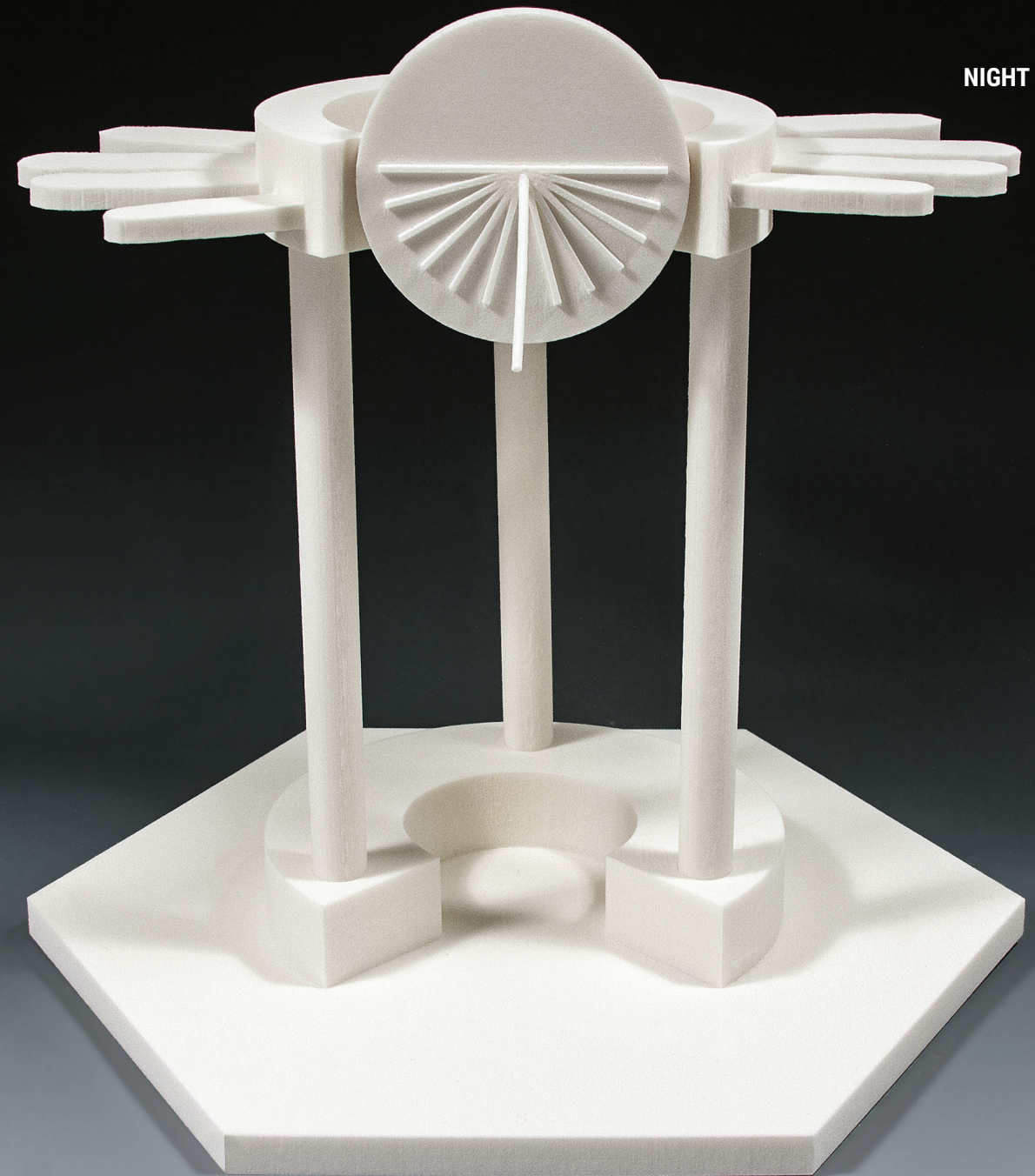
Educated as an engineer, Alvin Sher later studied art at the University of the Arts and earned his M.F.A. in sculpture from Indiana University. He was a recipient of a Fulbright Grant and a National Endowment for the Arts Award. His sculptures have appeared in more than 300 exhibitions in the U.S., Europe, Africa and Asia. His sculptures have been reviewed in many American and international publications. Sher has taught at Goldsmiths College, University of London; Indiana University; Hobart and William Smith College; and New York Arts Program Director.

## ARTIST STATEMENT

"I create sculptures using imaginary architectural elements. The works express our needs and curiosity in today's world through forms such as temples, altars and observatories. My work is influenced by both modern and ancient places and structures. The sculptures relate to the built world we inhabit, adding layers of meaning in the sculptures so that viewers come to the work for both contemplation and curiosity. My interest in astronomy and the environment has led me to incorporate numerous solar and seasonal measuring devices into both large and small-scale sculptures. The form of my hand appears in many of my works as both a signature and a symbol of man's curiosity and presence. I take apart forms of experience and re-assemble them working back against cultural currents to arrive at the original meanings of the ideas I started from. I have worked with 3D CAD computer software creating sculptures for decades. This computer technology led to models in stereo lithography and other solid freeform fabrication technologies. I use casting/printings for both exhibition and 3D presentations. I also create small works in

iron, bronze and aluminum using drawings and my computer imagery to explore these ideas. Digital lithography has added to my tool chest, combining two and three dimensions to aid in design, calculations and fabrication and the creation of my sculptures. Large sculptures are fabricated using computer guided fabrication plasma cutting and heli-arc welding. My smaller works might become studies for larger sculptures, or as complete works that inspire other sculptures. My sculptures evolve in a process of discovery that starts with reference to ideas that may morph into another concept, a number of times. The search often results in a new image that barely shows much of the original references."

NIGHT DIAL



# Robert Michael Smith

[iris.nyit.edu/~rsmith/index2.html](http://iris.nyit.edu/~rsmith/index2.html)

New York, New York, USA



## BIOGRAPHY

Robert Michael Smith has been an active pioneer of digital sculpture, 3D computer design, Web design, visualization/animation, and virtual sculptures for the Web, as well as a significant art and technology educator as an associate professor of art and technology at New York Institute of Technology, Fine Arts Department. Smith is also the NYIT Middle East Fine Arts Computer Graphics Coordinator for Global Exchange Programs at Amman, Jordan; Kingdom of Bahrain, and Abu Dhabi, United Arab Emirates. His work has been exhibited worldwide for more than 30 years, including at the acclaimed Digital Stone Exhibition at Beijing Today Art Museum, Shanghai Duolun Museum of Modern Art, Chongqing Jinse Gallery, and Wenzhou ArtMap Gallery. Smith's sculpture "Paradise Bird Burlesque" is included in the permanent collection of the China National Museum of Fine Art at Beijing. Smith has also been a guest lecturer at numerous universities, international conferences, and has been featured in several international articles and books, including "Art of the Digital Age," published by Thames and Hudson.

## ARTIST STATEMENT

"Art is alchemy. Alchemy is the magic, observation, process and ritual of life. My sculptures, both virtual and actual, are conversations regarding the archetypal forms that are the basic structures of nature. I build alien abstract worlds that become familiar through frequent immersion. These worlds are constructed to open exploration to the deepest regions of the human psyche for development within the landscape of the imagination. During the past several years, I have worked with Asian artisans to realize in stone, metal and wood, the fantastic forms that I have been developing in cyberspace since the early 1990s after introduction to the first professional-level modeling and animation software application for the PC. This development afforded the quantum aesthetic leap that has impacted my work for the past 20 years by significantly speeding up the dimensional design process while simultaneously allowing me to view evolutionary changes in my forms through time (animation)."

DIPLODIAL PAS DE DEAUX



# Kim Thoman

[www.kimthoman.com](http://www.kimthoman.com)

Emeryville, California, USA

## BIOGRAPHY

Born in Lincoln, Nebraska, Kim Thoman's interest in art led her to the University of California, Davis, where she studied ceramics, and then to UC Berkeley, where she studied painting and drawing, receiving her B.A. in 1972. Thoman's work at Berkeley gave her the opportunity to dig deep into making both two- and three-dimensional work. She received her M.F.A. in ceramic sculpture from San Francisco State University in 1979. In 2011, Thoman discovered 3D printing, re-igniting her long-dormant interest in exploring sculptural dimension. She found that making sculpture allowed her to visually expand and develop her core belief that duality exists in everything. Thoman's work has developed in distinct phases throughout the years, and her recent work includes a series of geometric images with attached ceramic intestine-like forms and hard-edged paintings with cartoon-like images of men and women entangled in an embrace in which they simultaneously oppose and complete one another. Thoman found the computer to be the perfect tool for both her image making and 3D printing. Thoman's work has been exhibited in many solo exhibitions



including at Virginia Tech University, Blacksburg, Virginia; JFK University, Orinda, California; Stanford Art Spaces, Palo Alto, California; Oakopolis Gallery, Oakland, California; Monterey Peninsula College, Monterey, California; and Bank of America World Headquarters, San Francisco, California. Upcoming solo exhibitions include The Anderson Art Center in Indiana, the Mendocino Art Center and SOKA University in California.

## ARTIST STATEMENT

"My artwork is based on a philosophical view that duality exists in everything. Both the images and the processes I use are all in the service of this idea that opposites are everywhere. I am aware of their presence in the world around me, such as intellect and intuition, male and female, stillness and movement, body and soul, light and dark, mechanical and hand-made, seen and unseen, or life and death. Although I'm focused on ideas that oppose each other, I'm always looking for overall balance. In the early 2010s, I discovered computer technology and delved into a new field where I could make

digitally created 3-dimensional shapes and construct them using 3D printing. The Venus form emerged, a rounded, elegant, feminine shape that I digitally wrapped with images of my paintings for skin. The Venus shapes are my metaphor for what great possibility can be born, and are symbolic of what can burst forth in this world. They hold a graceful shape, and are pregnant with hope and expectation, yet are often limited, contained or restricted by the structure that keeps them in place. By incorporating and juxtaposing disparate elements in two and three dimensions, I search for a new sense of wholeness or truth."

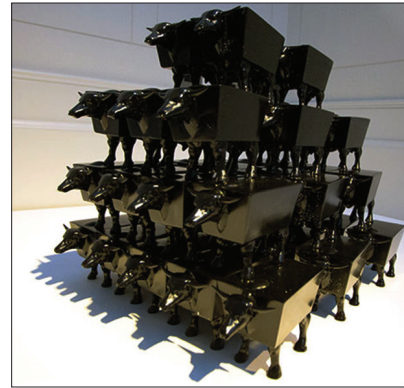
## EMERGING VENUS 1



# David Van Ness

[www.davidvanness.com](http://www.davidvanness.com)

Flagstaff, Arizona, USA



## BIOGRAPHY

David Van Ness was born and raised in Dallas, Texas. In 2003, he received his M.F.A. in sculpture from Cranbrook Academy of Art in Michigan. After graduating, Van Ness moved back to Dallas and began working as an educator at a variety of colleges and universities in the Metroplex. In 2004, at a conference on art handling, he met with SculptCAD, a Dallas-based 3D printing service provider, with whom he would later work with on several projects and conferences. In 2005, Van Ness was asked by a gallery in New York for 500 of his "Stacking Cows." After researching different ideas David approached SculpCAD and, with their help, created his first digital sculpture that was then mass produced in China. Since then, "Stacking Cows" and many of Van Ness' other 3D-printed sculptures have traveled the world, exhibited in numerous national and international shows on 3D printing, including the 3D Print Show in London and New York. Van Ness currently lives in Flagstaff, Arizona, where he is the coordinator of Foundations for Northern Arizona University.

## ARTIST STATEMENT

*We all know that our modern, fast track, hi flying, giga byte, money making, stock inflating, Broadway boogie woogie world is also a fast food guzzling, consumer driven, resource eating, air polluting, earth poisoning, Prozac popping monster that has run out of control.*

—Robert Brown on John Isaacs

"Soon, artists will be able to manipulate the world as they do clay. Mankind will dictate the look and function of everything and replace nature as the driving force of evolution. Machines will become organic and organic will become mechanical. What becomes of a world created by its creations? Until then, we jam ear buds into our ears and turn on movies and games to disconnect and enter our own worlds. These worlds, though connected to the real world, are illusions that reflect our desires. The more time that we spend in these worlds, the less the real world makes sense and it becomes an illusion itself. As we return to the real world, we use technology to record, explore and emulate it so that we can then take it with us back into the

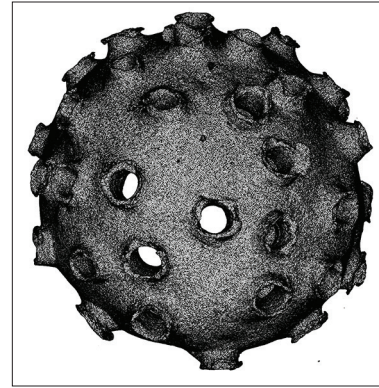
virtual world and manipulate it to our desires. I do not claim to know what we should do, nor do I wish to pass on my opinion. Instead, I wish to point at the problem and explore the beauty that could potentially be made, as well as the grotesque that is also possible. Sometimes these two ideas, beauty and disgust, are one and the same."

## FRACTURED BUFFALO



# Patrick Visentin

Montreal, Quebec, Canada



## BIOGRAPHY

Patrick Dominic Visentin is an artist and educator living and working in Montreal, Quebec. He studied in Canada, receiving a master's degree in print media from Concordia University, as well as a B.F.A. from Mount Allison University and a B.A. from St. Francis Xavier University. Visentin is a multidisciplinary artist whose work includes drawing, photography, printmaking and video installation and performance. He has participated in various group and solo exhibitions in Canada, the U.S. and Europe.

## ARTIST STATEMENT

"My present practice involves the examination and portrayal of fictitious biological entities. I begin by creating wax maquettes and digitize them using CT scanners, laser scanners and digital cameras. I then use computer software to alter and recombine the resulting digital information to create new hybrid entities. The resulting biofictions are then output as 2D prints and 3D-printed sculptures."

DARK MATTER



# Mary Hale Visser

[www.mavissersculpture.com](http://www.mavissersculpture.com)

Georgetown, Texas, USA



## BIOGRAPHY

Mary Hale Visser Professor of Art and Brown Chair holder teaches art at Southwestern University in Georgetown, Texas. Visser received her M.F.A. in sculpture from The Ohio State University under David Black world renown sculptor. Visser's artwork has appeared in more than 130-juried national and international exhibitions where she has received awards such as the "Design Excellence Award" from the City of Austin Design Commission, a Mellon Technology Fellowship, and a Mundy Fellowship for her research in 3D Printed sculptural forms. Visser has completed several large-scale public and private commissions installed in the cities of Washington, D.C.; Sacramento, California; Austin, Texas; Lenexa, Kansas and Columbus, Ohio. Her work appears in many public and private collections. In 2008 she exhibited in the prestigious e-Form exhibition of rapid prototyped sculptures to tour China during the Olympic games. Visser regularly exhibits and contributes to international conferences such as SIGGRAPH and INTERSCULPT on digital sculpture around the world. She has curated four prominent international digital sculpture exhibitions. Her work

has been included in several multimedia and video presentations in the United States and Europe. Visser's artwork has been featured in *3D Printing for Artists, Designers, and Makers*, *Texas Monthly*, *Artspace*, *Ceramics Monthly*, *Sculpture International* and in the book, *A Comprehensive Guide to Outdoor Sculpture in Texas*. Visser is one of the first group of international artists who pioneered the use of 3D Printing and digital technologies in sculpture. She is vice president of Ars Mathematica of Paris, France an international non-profit organization devoted to promoting digital sculpture. The Director of Ars Mathematica Christian Lavigne and Professor Visser are writing a book on the history and pioneers of digital sculpture soon to be published. Visser's research focuses on the use of digital 3D modeling and 3D Printing to create complex abstract figurative sculptures.

## ARTIST STATEMENT

"How extraordinary it is to be human, struggling to communicate, to live a meaningful life, albeit so briefly. Myths, legends, stories and poems of individual human endeavors draw me in to

search for that elusive and ever changing spirit, the intangible made real. What is it that we see in an individual human action that imprints upon our perception to the exclusion of all other versions of the same event? As one can see body language is essential to my work and solid modeling allows me to incorporate the delicate gestures, subtle contours and complex structure of the human body into a detailed rhythm of forms and gestures. I am interested in presenting the variations of complex moments in time for each work, thus presenting a different perspective that may contradict a previous perspective. I am drawn to record these events as life is constantly changing and what we perceive changes along with these variations. What we think is true is only true for one moment or one memory. It is this elusive spirit that drives us to recreate that moment in time. It is this changing perception that I try to capture in my work, thus my works will look entirely different from each viewpoint, but still connected as one form. An event is made up of many moments and we perceive only one moment depending upon our perspective."



EVE'S DANCE



# Alexandre Vitkine

1910–2014

[www.arsmathematica.org](http://www.arsmathematica.org)

Paris, France



## BIOGRAPHY

Born in 1910, Alexandre Vitkine, after a career in industry, became a photographer specializing in abstract industrial silhouettes and drawings produced by self-made electronic devices. In 1967, he produced a short abstract film, "Chromophonie," using original processes of his own invention. His credo was simplicity; the photographs are images reduced to essentials and his drawings use mathematical shapes. In 1988, Vitkine added a third dimension to his drawings, which then became sculptures. He named the process "infosculptures." These forms would be produced by a computer-controlled milling machine for which he wrote the software. In 1992, he co-founded Ars Mathematica with Christian Lavigne, with the goal of creating an international center for digital sculpture that he named the "Creatron." His works appear in museums and private collections around the world. At age 104, Vitkine was an active artist and participant in Ars Mathematica in Paris, France, until his death in fall 2014.

## ARTIST STATEMENT

"In my infosculptures, there is very little influence or inspiration from mathematics. However, for me, they are very useful tools for simple shapes, devoid of irregularities. They are defined by their contours which are either Lissajous or Bowditch Curves, or contours surrounding a Logarithmic Spiral. In the Lissajous figures, the closed curves X and Y coordinates are the sum or difference of sinusoidal functions. These forms come from my Chromophonie, which displays the interactions of colored light movement across the tube at intervals. The Spiral is the axis of the contour is a logarithmic spiral that is defined by the covered angle, the radius of the beginning of the spiral and the end of its radius. The closed curve that surrounds this spiral is defined by the half-width at the start and the half-width at the end of the spiral."

## BOULE-ONDULE E-LUMINEUSE



# Andrew Werby

[www.juxtamorph.com](http://www.juxtamorph.com)

Oakland, California, USA



## BIOGRAPHY

Andrew Werby graduated from the University of California in 1974 with a B.A. in design. Afterward, he continued his education privately at various institutions, learning holography, glass-blowing, video and film-making, sculpture, ceramics, machine shop, kiln-cast glass, and electronic prototyping. He first developed his Juxtamorphic style by making molds from specimens in the university's Paleontology, Geology and Anthropology Departmental collections, combining the resulting castings to create cast bronze and aluminum sculpture. He later went on to found with other artists the Juxtamorphic Art Movement, finding new ways to use nature in art, which mounted self-curated group shows in Berkeley, San Francisco, and Seattle. In 1975, he founded United Artworks, a company dedicated to the design and production of sculpture, jewelry and architectural accessories. In 1997, Werby began experimenting with the adaptation of computer technology to his working process, applying scanning, modeling and milling operations to the creation of fine art. His personal work in this field includes applications of the Juxtamorphic aesthetic to digitally mediated

jewelry, ceramics, woodcarving, plastics and sculpture. He has exhibited his work around the U.S., as well as in Europe and Asia, in conjunction with like-minded artists who also produce sculpture using digital tools.

## ARTIST STATEMENT

"I started out by taking molds of natural objects, casting them in wax, and assembling composite objects which were then remolded and cast in various materials, primarily bronze, but also in aluminum and other metals, ceramic, various cements and plastics. Now, I do essentially the same thing by digitizing natural forms and textures with 3D scanners, then combining them in the computer using haptic (force-feedback) modeling tools. This gives me greater freedom in merging forms, as scale is no longer an issue, and shapes can be modified more easily. These composite assemblies are then produced as physical sculptures by using either computer-controlled milling machines (CNC) or additive 3D printers. While my Juxtamorphic process was previously restricted to castings, with this new technique I'm able to do

carving in wood and other materials with the same fluidity. With this technique I can also produce molds and stamps for use in ceramics, giving me access to a loose and spontaneous building process for one-off sculptures and vessels. Using a 3D printer, I'm now able to produce pieces with configurations that really can't be carved accurately, either by hand or using CNC. This method of working also allows me to produce maquettes—small models of proposed larger sculptures for presentation—that exactly resemble the final product, something that was not possible with my earlier technique, which always was tied to full-sized objects. While this technology, like most new ways of making things, can be used to perform traditional tasks, like the enlargement of small models to monumental size, more efficiently, what excites me more is the possibility of doing things that couldn't be done at all before. That, for me, is where the untapped potential of these new tools is to be discovered. I feel I am awakening people to the intrinsic beauty of the natural world that created us."

RAMGYPSBISTO



# Laura West

[www.laurawestportfolio.com](http://www.laurawestportfolio.com)

Fresno, California, USA



## BIOGRAPHY

Laura West has been creating sculpture/installation art since her undergraduate studies at Southern Illinois University. The process of creating sculpture has all the freedom for exploration and expression that she found as a painter, and all the technical challenges that she found in engineering. West continued her studies at Idaho State University, during which time she became a faculty member at Montana State University. West's 500-mile commute took her through Yellowstone National Park weekly for two years. The big skies and towering mountains influenced her shifting explorations of the figure to include environmental works touching the relationship between the body and the natural world. After graduate school, West became a teacher at the Johnson Atelier Technical Institute and School of Sculpture in New Jersey, where students worked with internationally known artists to create large-scale castings and public art. In 1999, West became professor at Fresno City College. Her work has been exhibited internationally and focuses on the placement of cast figurative elements within installation and environmental formats. In 1999,

her work expanded to include the use of digital technology and additive manufacturing. West is known for her innovations in the application of 3d printing technologies for sculpture and casting as an extension of the traditional casting process. She used molds and casting as a method to alter the form and explore variations. Manipulating the image in the computer has replaced this process.

## ARTIST STATEMENT

"My sculptural work is minimally derived, influenced by the figure and ephemeral in nature. I have a love for the object and I continue to obsessively create figures in various scale, media and forms. My favored formats to portray my ideas are with interactive installations and also in temporal works installed at natural sites. Exploring both elements of the figure, as well as the effect of time and nature on these forms, intrigues me. With my work, I want the viewers to ask questions about their own bodies, their interaction with the space around them, and their place in the outer world. We are carried through life in fragile containers of skin and

bone that are eternally connected with the surrounding environment. I enjoy using parts of the body that are unnoticed or hidden, and looking at their uniqueness. I also enjoy playing with the contrast between interior and exterior forms: how the positive spaces of the body can become a container that infers its purpose of being a chamber for the soul."

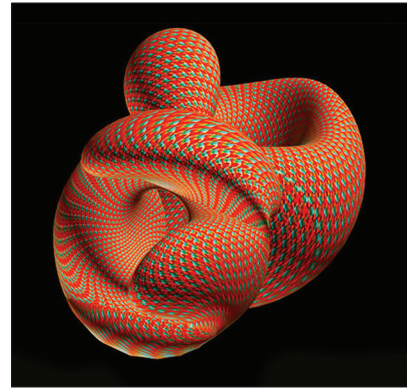
INWARD GAZE



# Corinne Whitaker

[www.digitalgiraffe.com](http://www.digitalgiraffe.com)

Foster City, California, USA



## BIOGRAPHY

Corinne Whitaker, aka the Digital Giraffe, has been acclaimed for more than 30 years as one of the pioneering artists in the fields of digital sculpture and painting. She has exhibited both nationally and internationally in more than 80 solo and 200 group exhibitions, including "Corinne Whitaker dot Uncom" at the San Bernardino County Museum. Her work has been published in more than 100 magazines, books, catalogs, media and newspapers. She presented the first digital fine art exhibition in India and has shown work in Thailand, Germany, England, Japan, Russia, China and Italy. She has shown at the Austin Museum of Digital Art and the Museum of Computer Art. Whitaker has also been interviewed on live simulcast on London TV and the Internet. In 2007, she exhibited at Art Biennale in Florence, Italy. In 2010, she participated in the U.S. Biennale in New York, N.Y. Eight of her digital sculptures are located in DAAP, the world's first virtual sculpture park online. Whitaker is featured in the CD ROM and book, "Women Artists of the American West." Her work has won more than 30 awards, including "Best in CyberArt" and

two Golden Web Awards. She is presented in the book, "Art of the Digital Age," and the DVD set, "International Digital Sculpture, 2009." She is also the author of six books of digital paintings and poetry. Whitaker's award-winning Digital Giraffe online journal ([www.giraffe.com](http://www.giraffe.com)) is now in its 20th year of Web publication. She has been actively involved in the art community as a board member of the Fellows of Contemporary Art in Los Angeles and the Carmel Gallery Alliance. She also founded and curated the "Sculpture Withindoors" exhibit at the Carmel Art Festival. Whitaker is represented on the West coast by the Paul Mahder Gallery in San Francisco.

## ARTIST STATEMENT

"From three little children to three wise men, a powerful triumvirate fills our myths. 'And some folks thought 'twas a dream they'd dreamed/of sailing that beautiful sea.' Digital sculptors have been dreaming of magical journeys into the land of zeros and ones for as long as we could create in 3D, and even before when we waited for the technology to catch up with our dreams. We

yearned for curves, for organic shapes. We were hemmed in by edges and corners, the building blocks of the digital world. We knew that the larger Universe was probably lop-sided and we wanted to follow that vision. We also knew that another species would soon be replacing our own. We were willing to cross the borders of biological sanity and imagine creatures that were not mirror images of ourselves: hybrid species, multiple limbs, beings that never fart, don't wet their beds, and don't throw up over Mars. As the borders between living and nonliving began to dissolve, we imagined a species that could exist in the synapses of consciousness, nanorobotic forms that might not recognize us as their ancestors, and might not want to. 3D printing brought the magical world of tomorrow into today's toolbox. Wynken, Blynken and Oz are three of those maybe-tomorrow figures, sailing that magical sea of 3D printing."

TRANS SPECIES



# Derrick Woodham

[www.derrickwoodham.net](http://www.derrickwoodham.net)

Cincinnati, Ohio, USA



## BIOGRAPHY

Derrick Woodham was born and educated in Great Britain, graduating from the Royal College of Art in 1966. Before coming to the U.S. to live in 1968, he represented contemporary trends in British sculpture in many group exhibitions, which traveled in Europe, the U.S. and Japan. He also shared the Prix de la Ville de Paris at the Paris Biennale in 1965, and served as a member of The Arts Council of Great Britain. Since 1968, he has taught at the Philadelphia College of Art, the University of Iowa, and the University of Kentucky. From 1980–1995, he was Director of The School of Art at University of Cincinnati, where he taught sculpture and electronic art. He retired from teaching in 2001. Woodham has participated in many group and touring exhibitions in the U.S., including “Primary Structures” at the Jewish Museum, New York, 1966, revisited as part of “Other Primary Structures” in 2014; the National Drawing Exhibition, 1969; and the National Sculpture Exhibition, 1976. Solo exhibitions in the U.S. include shows at the Jewish Museum, Richard Feigen Gallery, and J H Duffy and Sons in New York. He completed two large-scale commissions for Cincinnati Gas

and Electric Company’s headquarters building in Ohio. He began to model and design his sculpture on the computer in 1993, and has hosted a number of exhibitions of sculpture in DAAP, his Internet-based multi-user three-dimensional environment, including—since 1997—the Intersculpt series of international biennial exhibitions of computer generated sculpture in collaboration with Ars Mathematica.

## ARTIST STATEMENT

“For most of my career, I’ve championed the proposition that geometry, as perfectly defined structure, is a metaphor in art for the ideal, and engineered materials and finishes represent our best attempts to achieve physical perfection. Computer generated digital sculpture succinctly reinforces this. I’m also attracted by the abstract nature of the medium, the digital environment. As an ‘abstract’ sculptor, I feel that working in the abstract with potentially physical and material properties of form in space, in a realm previously limited to physical experiment, allows this metaphor for the ideal to be more fully exercised in the design

and production of the artwork. What attracts me most to the prospect of designing sculpture on the computer is the variety of inputs and outcomes available for a final design, and for its constituent parts, even its production processes. I have ‘remade’ pre-existing sculptures on the computer; used the computer to design sculptures for fabrication and display in the real world, either using traditional or computer-based production processes; and designed computer-based models of sculpture for use in virtual reality environments accessible via the Internet. The potential for the exchange of interests between sculpture and other forms of expression has been substantially enhanced by the availability of digitally mastered form.”

## AUTOPORTRAIT



# Southwestern University

[www.southwestern.edu](http://www.southwestern.edu)



For 175 years, Southwestern University has been engaging minds and transforming lives. In 1835, Col. William B. Travis penned a letter to the "New York Christian Advocate" calling for the establishment of a Methodist presence in the new Republic of Texas. Five years later, the first of Southwestern's four root colleges was born from the vision of Methodist missionary, Martin Ruter.

Southwestern University is an independent, four-year, undergraduate, national liberal arts and sciences college with chapters of the Phi Beta Kappa and Alpha Chi honor societies and the Omicron Delta Kappa national leadership honor society.

Affiliated with The United Methodist Church, the University is comprised of the Brown College of Arts and Sciences and the Sarofim School of Fine Arts. With nearly 50 major and minor fields of study, Southwestern is classified as a Baccalaureate I institution, placing it among the finest national liberal arts colleges in the Nation.

Fall 2014 enrollment was 1,536. 37 percent of entering students graduated in the top 10 percent of their high school class. The average

SAT score was 1157. Thirty-three percent of Southwestern students come from under-represented groups. Southwestern has a 12:1 student-faculty ration with 100 percent of tenured or tenure-track faculty holding the highest degree in their field.

Southwestern's 20 men's and women's inter-collegiate sports teams compete in Division III of the National Collegiate Athletic Association (NCAA) through membership in the Southern Collegiate Athletic Conference (SCAC).

Southwestern is one of 40 colleges included in every edition of the book *Colleges That Change Lives*. *U.S. News & World Report* ranks Southwestern #1 National Liberal Arts Colleges in Texas. *Washington Monthly* rates schools based on their contribution to the public good, ranking Southwestern 1st among Texas liberal arts colleges and in the top 40 nationwide. *Forbes* has recognized Southwestern as one of the top 200 colleges in the nation and 7th among Texas institutions. Southwestern is in the 2015 edition of *The Best 379 Colleges* published by the Princeton Review, which rated Southwestern #8 in the country for Best Career Services. Southwestern is included in *Kiplinger's*

2014 list of the 100 top values in liberal arts colleges, and is one of 44 colleges and universities in the country to be named a Best Buy school in the 2015 edition of the *Fiske Guide to Colleges*. *Money Magazine's* Best Colleges lists Southwestern in the top 25 percent of four-year colleges in the nation based on value. *USA Today College*, which uses a methodology highly focused on outcomes, ranks Southwestern as the top national liberal arts college in the state of Texas.

Southwestern offers students a residential campus with small classes and numerous collaborative undergraduate research opportunities. Outside the classroom, students are civically engaged and volunteer in the community at more than twice the national average. One third of all students study abroad at least once, and most take advantage of leadership, service and activism opportunities in Southwestern's 100+ student organizations. More than half of all students complete at least one internship experience and 91 percent have found employment or have been accepted to graduate/professional school within 10 months of graduation.

## REFLECTIONS

Mary Visser





Southwestern  
CELEBRATE 175 YEARS