NOKIA Bell Labs

EXPERIMENTS IN ART AND TECHNOLOGY

Nokia Bell Labs would like to thank Hello Velocity for their design assistance with the E.A.T. word mark.

Agenda

July 27, 2016

1pm-1:50pm
Lunch and Mingle
Oak Room

2pm-5pm
Artist and Bell Labs Technology Exhibits
"E.A.T. Fast Food"
West Cafeteria

5pm-5:30pm
Bell Labs Technology Showcase and Live Voder
Tech Showcase

5:30pm-6:15pm
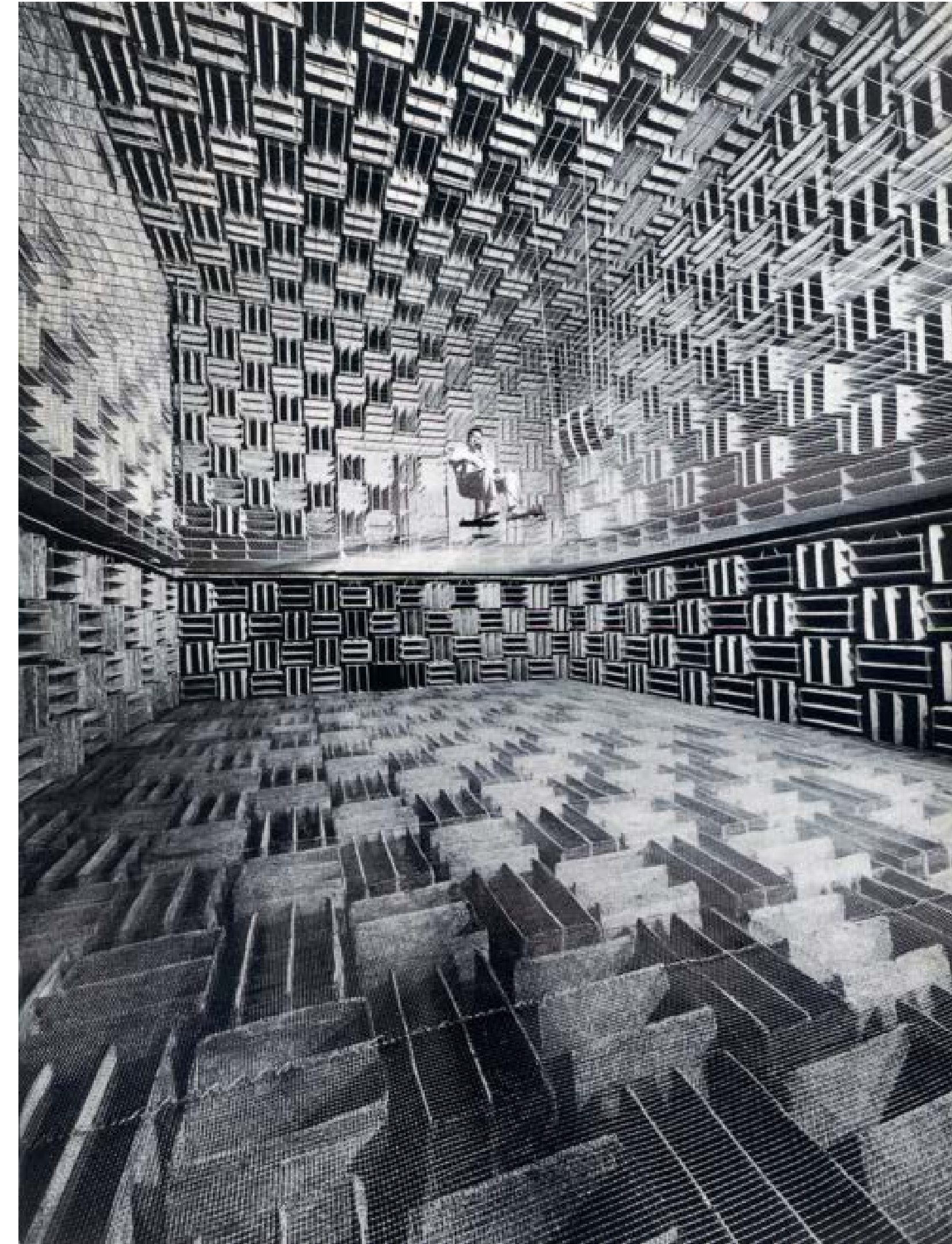E.A.T. Musings
Oak Room

6:15pm-7pm
Cocktail Reception

7pm-8pm
Tour and Photos in the Famed Bell Labs Anechoic Chamber

8pm
Close and transport to NYC

Archive Photograph of the Bell Labs Anechoic Chamber

Welcome address
by Marcus Weldon
President of Nokia Bell Labs
and CTO of Nokia

Archived photographs of various E.A.T. performances

2016 marks the 50th anniversary of the pioneering collaboration between artists and technologists known collectively as Experiments in Arts and Technology (E.A.T.). Despite being much heralded at their inception and spawning many chapters worldwide, E.A.T. has been a little dormant for the past decades, because in many ways the ideas were so 'avant garde' that they were well ahead of their time. But as art and technology have become deeply intertwined, with the rise of smartphones and their canonical apps, cloud based creative software platforms, sophisticated digital image capture devices, and immersive, large scale digital displays or head-mounted VR goggles, art and technology are becoming truly coupled, or perhaps even symbiotic. So the time to EAT has come and, if you pardon the excessive use of a metaphor, to again combine the art and technology ingredients to create something that takes the human palette to places previously unimagined.

Bell Labs has a long and distinguished history in the creation and production of the digital arts.   In video, Bell Labs broadcast the first long distance TV signal in 1927, transmitted the first satellite video signal across the Atlantic, invented the charge-coupled-devices (CCD – digital image sensor) in 1969, and pioneered high definition TV, making seminal contributions to the standard that came to define compressed video (MPEG) and audio (MP3).

"combine the art and technology ingredients to create something that takes the human palette to places previously unimagined."

In sound, Bell Labs invented High Fidelity stereo recording and reproduction in the early 1930s, having also participated in early sound-motion picture productions such as "The Jazz Singer". We created the first computer-generated singing voice in 1961 and then pioneered the early fields of computer generated graphics, art, and movies. Bell Labs also originated the basic signal processing algorithms and hardware that are ubiquitous in music, video and other areas today.

And we continue to explore new dimensions of the senses, examining movement and motion, emotion and sensory measurements, in order to try to discern intent or needs or even desires! We are also working on methods to help people think more efficiently using a combination of machine learning and new graph-based mathematics to augment human intelligence and perception.

But, in turn, we expect our artistic sensibilities to be challenged and augmented by you, as artists and creatives, who perceive not only the value of simple knowledge but more complex aesthetic value. And working together symbiotically, we will, I believe, be able to arrive at the upper levels of Maslow's hierarchy of human needs and achieve 'transcendence'.

So, welcome everyone to the first Bell Labs salon of E.A.T. v2.0!

References:
Bell Labs Archives
https://en.wikipedia.org/wiki/Experiments_in_Art_and_Technology

Nokia Bell Labs

Rich Abbot

After five years in the aerospace industry, Rich joined AT&T Bell Laboratories in 1983. Since then he has worked on a wide range of telecommunications products, and contributed to research in switching, transmission, network visualization, remote diagnostics, video coding and distribution, speech recognition, and fault-tolerant systems. Rich co-invented the S46 data routing protocol, and participated in two commercial ventures, Lucent Speech Solutions and Lucent Digital Video. More recently Rich was the architect of the Nokia Bell Labs "iRoom," a sensor rich environment with learning capability. Rich is the system architect for the Human Digital Orchestra, and hopes to continue exploring the relationship between sensing technologies and the arts. Rich holds a BSE degree in Computer Engineering from the Moore School, University of Pennsylvania, and an MS degree in Computer Science from Villanova University.

Susanne Arney

Susanne Arney is a Senior Director and Bell Labs Fellow responsible for Strategic Initiatives and Partnerships including the revival of Bell Labs' Experiments in Arts and Technology (E.A.T.) and Artist in Residence programs. She was Project Manager for the premier performance of the Bell Labs Human Digital Orchestra™ in "Shannon Effect", April 28 at Nokia Bell Labs and relishes the intricacies of melding the dramatic arts with science and technology, tempered and honed by the pragmatics of real-world constraints. Co-inventor on 18 issued patents in micro/nano electrical, mechanical, and optical component design, fabrication and reliability physics and related fields, Susanne completed her B.S. in Materials Science at MIT and M.S. and Ph.D. in Electrical Engineering at Cornell University.

Charles Bahr

Charles Bahr leads the team developing the infrastructure and delivering information internally and externally about Bell Labs research from its origin to the present day, through web sites, the Nokia corporate library, and other electronic and visual media such as the Bell Labs Anomaly room. His career at Bell Labs spans fundamental chemical physics, industrial automation, optical materials science, and video networking. Charles received a Ph.D. in physical chemistry from the University of California, Berkeley for research in photoelectron diffraction. He resides in New Jersey with his family of 4.

Mark Clougherty

Mark Clougherty is a Strategic Technology Advisor and Bell Labs Fellow with Nokia Bell Labs. His primary areas of interest are Edge Cloud, Network Functions Virtualization, Software Defined Networking, the future of communications applications, and Cybersecurity. Previous to this, Mark spent the vbulk of his 30+ year career as a software and system architect building Fixed Access systems, including Digital Loop Carrier systems, DSLAMs, and GPON OLTs and ONTs. Mark has written papers on a wide variety of topics including access systems, PSTN transformation, personalized advertising delivery, optimized delivery of streaming video over mobile networks, NFV, SDN, and Cybersecurity.

Brian Donnelly

Brian is a Ph.D. graduate from the Fluids and Heat Transfer Research Group based in Trinity College Dublin, Ireland following on from an undergraduate degree in Mechanical Engineering. Starting in Bell Labs in May 2011 as an intern, he is now a Senior Member of Technical Staff. His research includes novel cooling solutions for high power telecommunications electronics, specifically for use in central offices and data centers. Brian is currently working in the hardware incubating activity in Dublin.

Alex Duque

Alex Duque designed communication satellite hardware for Lockheed-Martin Corporation and designed digital communication ASICs for Lucent Technologies. Alex is a member of various departments at Bell Labs where he develops ASIC and FPGA designs for research and Nokia products.

Mark Earnshaw

Dr. Mark Earnshaw is Director of Hybrid Photonic Integration Research at Nokia Bell Labs in Murray Hill, New Jersey. In 1999 he joined Bell Labs where he has worked on photonic integrated circuits, optical cross-connects and wavelength switching devices. His recent research work has focused on developing a hybrid integration platform for extremely efficient high-speed, parallel, wavelength division multiplexed transceivers. Mark Earnshaw has received the Bell Labs President's award and Bell Labs CTO award.

Ed Eckert

Ed Eckert is the Bell Labs Archivist and Senior Manager of IIS Intellectual Property Services and is building a collection of over 40,000 items. Ed also manages and curates the Bell Labs Technology Showcase museum at the Nokia Bell Labs headquarters in Murray Hill, NJ.

Jason Elliott

With two decades of I.T. and wireless communications expertise, Jason has contributed to showcasing many 'industry-firsts' such as the 'LTE connected car' and multi-site virtualized RAN with edge applications at the world's foremost industry events.

Now supporting the company's 5G market development program, working with research, product teams and industry partners to develop and promote our leadership and vision in 5G.

An Anglo-American, now residing in Massachusetts, Jason is a founding member of a local charity and runs regularly to off-set his love of cooking and eating seafood.

Ellen Ferguson

Ellen Ferguson is the planning and operations lead for Nokia Bell Labs. Ellen has been instrumental in implementing the new Nokia Bell Labs operating model, working with all research organizations, CTO and Bell Labs Consulting.

Domhnaill Hernon

Domhnaill Hernon is Director of Research at Nokia Bell Labs in the areas of thermal management, energy harvesting and storage, photonics integration and packaging and audio visual research. He is also chartered with leading site wide research engagement initiatives in Murray Hill and external engagements with the local creative community such as E.A.T.

Domhnaill grew up in the North West of Ireland (Co. Sligo) and comes from a well known family of musicians, dancers and singers in the traditional Irish music scene and he plays the fiddle. Domhnaill has recorded CDs, played on live radio and appeared on TV.

Domhnaill Holds a B.Eng in Aeronautical Engineering and a Ph.D. in the study of fundamental fluid mechanics from the University of Limerick and an Executive M.B.A. from Dublin City University.

Howard Huang

Howard Huang works in the Mobile Radio Research Lab of Nokia Bell Labs. In his 20-plus year career, he has worked on a variety of technologies for increasing the data rates and capacity of cellular networks. More recently he has been working on an alternative to GPS for tracking objects using signals from cell phone towers.

Dorel Livescu

Dorel, rather than being the protagonist in a play, usually performs the shadow role of the glue that binds, and keeps the shining characters together to make the performance whole and a complete success. Lately he has been involved in the X- line of productions, mostly in the videographic area. An example is the production "Watching the Moving Statues", in which the protagonists, Graham Bell and Claude Shannon, stand side-by-side, blending communication and information theory to provide us with reasons for more performances. With great ability, Dorel pulled the strings (and wires), literally and metaphorically to achieve the success awaited by a select audience. However, his biggest, well known production is the genetically engineered, "The Horn or Ray of Light". This production was presented and enhanced through the years at Princeton, MIT, Technion, Weizmann Institute and performs daily at University of Chicago.

Using a similar genetic technology but driven by the power of convincing and delegating, with East European influences, two new young productions from the same family recently hit the stage: "God's Messenger" and "Lost Civilization". They are amazing in their own rights and there is hope that one day they too will hit the big stage.

Kevin Nolan

Kevin has a First Class Honors Degree in Aeronautical Engineering, a Ph.D. in experimental fluid dynamics and was a Marie Curie Research Fellow at Imperial College London. Kevin also developed novel optics and software solutions for next generation qPCR instruments at a biomedical startup.

Kevin works at Nokia Bell Labs Ireland with the Thermal Group. His primary interests are Microfluidics, viscoelastic flows and imaging techniques such as Particle Image Velocimetry and Schlieren imaging for flow structure detection. He is a photographer, amateur graphic designer and 3D animator.

Larry O'Gorman

Larry is a Bell Labs Fellow in the Multimedia Research Department in Murray Hill, NJ, where he works in the area of video analytics. In previous work lives he has co-founded a biometrics company, taught at NYU/Poly and Cooper Union, and published several papers and two books. Between 2012 and 2015, he collaborated on the creation of public installations involving interactive video: Brooklyn Blooms at New York City's World Science Festival (2012, 2013), Pixelpalooza at the Liberty Science Center (2013-), and Butterflies Alight! (2015) in Hoboken, NJ. He is a Fellow of the IEEE and the IAPR, and received a Ph.D. degree in electrical engineering from Carnegie Mellon University.

Sanjay Patel

Sanjay Patel is Vice-President of Emerging Materials, Components and Devices Research at Nokia Bell Labs. Prior to this, Sanjay has served in various leadership roles both in Bell Labs and in the Fixed Networks Business Group.

Sanjay was active in the drama club and played the sitar in high school. Inspired by the rich E.A.T. legacy of Bell Labs, he and his team are actively engaged with artistes to take it to new heights! Sanjay holds a B.Tech. in Chemical Engineering from the Indian Institute of Technology, Kanpur, and a Ph.D. in Chemical Engineering and Materials Science from the University of Minnesota, Minneapolis.

Shreyas Shah

Shreyas Shah received his B.S. in Biomedical Engineering and Ph.D. in Chemistry and Chemical Biology from Rutgers University (New Brunswick, NJ). His doctoral research focused on developing nanomaterial-based 2D/3D scaffolds for applications in neural regeneration, drug delivery and optogenetics. He is currently building a new lab in Physiological Communications at Nokia Bell Labs.

Shahriar Shahramian

Shahriar Shahramian (M '06) received his Ph.D. degree from University of Toronto in 2010 where he focused on the design of mm-Wave data converters and transceivers. Dr. Shahramian has been with the Bell Labs division of Alcatel-Lucent (now Nokia), Murray Hill, NJ since 2009 and is currently the Director of the mm-Wave ASIC Research Department. He is also a member of the technical program committee of Compound Semiconductor Integrated Circuit Symposium. His research focus includes the design of mm-Wave wireless and wireline integrated circuits. He is the lead designer of several state-of-the-art ASICs for optical coherent and wireless backhaul product development at Nokia Bell Labs.

Ed Sutter

Ed started off as an infantry/medic/paratrooper in the 82nd Airborne Division of the US Army. While serving at Ft. Bragg, he attended night school and completed an AA degree in general education at Fayetteville State University.

After his enlistment (1978), he completed the Electrical Engineering program at DeVry Technical Institute in 1981. With the two diplomas, he started at AT&T Bell Labs in 1981 as a technical associate (TA), going to evening classes at New Jersey Institute of Technology to complete his BS degree in 1985.

He started in microprocessor board design, doing circuit design, board layout, backplane design and the associated firmware. Shortly after a few early projects, Ed shifted primarily into embedded systems firmware. He has several patents, authored the book "Embedded Systems Firmware Demystified" and is currently a Distinguished Member of the Technical Staff (DMTS) at Nokia Bell Labs.

Marcus Weldon

Marcus Weldon is the President of Nokia Bell Labs and the Chief Technology Officer of Nokia. Marcus is considered one of the luminaries in the industry for his vision, and track record of picking the right technological disruptions and opportunities, from vectoring for copper access, to the evolution of LTE overlay and Small Cells, to the emergence of virtualization and SDN and the movement towards edge cloud architectures. Marcus combines this vision with the power of Bell Labs to create a unique innovation engine whose goal is to "invent the future" of the networking and communications industry.

Chris White

Chris White leads the Network Algorithms, Protocols, and Security (NAPS) organization in Nokia Bell Labs. Chris' research interests include the development of computational models and methods for the simulation and control of interesting physical systems, included work in areas ranging from linear scaling quantum chemistry simulations, to the design of new optical devices, to the global control of transparent optical mesh networks and to understanding and facilitating the propagation of ideas in organizations. Current work focuses on exploring future trends, new technologies, and aligned strategic industries where data, information, and communications technologies can be leveraged to deliver forward looking applications and optimized end user experiences.

Paul Wilford

Paul is a Senior Director and Bell Labs Fellow. He leads a team of video and audio researchers at Nokia Bell Labs. They were responsible for creating the coding and broadcast standard for HDTV. They received an Emmy for this work, and launched a new business venture. Paul has over 30 patents and technical publications in the areas of video coding, broadcast TV, satellite media delivery and mobile video networking. He is responsible for several university collaborations. Current research interests are compressive sensing for media understanding, video analytics, sonification and multi-presence. Paul is working on virtual reality and relishes its connection to his fantasy that he is a good tennis player.

Artists and Curators

Chino Amobi

I would like to present my vision of a NON app/website which will socially unite cutting edge sound projects, art, and design created by people who are often underprivileged and under-represented, or invisible globally, with the large world of NONprofit businesses who seek social justice and a redistribution of cultural capitol. Participants in the app who contribute small, mid scale, or large funds to specified NONprofit organizations would thus gain access to unique experiences, products, as well as art, music videos, performances, critical discourses, and sound created by NON Citizens around the world, thus linking progressive art and design with the world of NONprofits whose aim is to effect the world in a positive way, by propagating and popularizing a culture of content creation in a way that is both tangible as well as incentive based for the apps/website users. Artists would be able to collaborate on projects with other artists around the world through the app, as well as build a dynamic, creative community through it. The more the user participates/contributes to the non profits, the richer there experience with the app/website will be and the more access they will gain to exclusive content created by artists from around the world. Ideally, they may become a content creator themselves.

Hannes Bend

Since 2014, Hannes Bend has been an an artist-in-residence at the Quantum Physics Alemán Lab and Institute of Neuroscience at the University of Oregon. He conducted neuroscientifc studies on meditation and visual stimuli for the creation of the virtual reality program "mYndful" with biofeedback to enhance the human ability for thermogenesis and improved mindfulness for everyday lifestyles and refugee camps. He presented internationally (e.g. Bronx Museum Biennale, NY; TSC Conference, Helsinki University; SLSA Conference 2015, Rice University, TX; Science of Consciousness, University of Arizona; won "Best Presentation Award" in panel "Computing Wellbeing," AAAI 2016 Spring Symposia, Stanford, CA).

Heidi Boisvert

Heidi Boisvert (PhD) creates groundbreaking games, web interactive, augmented reality and transmedia storytelling experiences for social change, as well as large-scale networked performances in dance and theatre using biotechnology. She co-founded XTH, a company exploring novel modes of expression through technology and the human body. She has been a Harvestworks Fellow with support by the Rockefeller Foundation whose works have been featured in Kotaku, TIME, Wired, Salon, Fast Company, Washington Post, the New York Times, and Atlantic, and showcased at EMPAC, Banff New Media Institute, Queens Museum, Kunsthalle and the Waag Society.

George Bolster

George Bolster works in New York City and has exhibited in museums and galleries in Europe and America. Selected solo exhibitions include: Archive for an Unmade Narrative, CPI, NY, US; Amazement Insulates Us All, Lab Gallery, Dublin, IRE; Un/natural History, Nuit Blanche (Commission), Toronto; High on Christ, Chung King Projects, LA. Group exhibitions include: Centre Culturel Irlandais, Paris; seachange, Galway, Ire; /seconds, Sharjah Art Foundation, Sharjah, UAE; These Days: Elegies for Modern Times, Mass MoCA, US. He received awards from the Irish Arts Council, and the Arts Council of England. He completed a residency at Rauschenberg Foundation and is artist in residence at SETI Institute and NASA Ames.

The central core of George Bolster's practice is an examination of belief systems. His skepticism about these systems is contrasted by his fascination with and exploration of belief. In his work he researches the propaganda and power of visual culture, continually and discreetly employed throughout recorded history by a variety of power structures for population control.

Maria Chavez

Born in Lima, Peru, Maria Chávez is known as an abstract turntablist, sound artist and DJ. Accidents, coincidence and failures are themes that unite her sound sculptures, installations and other works with her solo turntable performance practice.

Currently, Maria is a research fellow with the Sound Practice Research Department of Goldsmith's University of London and has given lectures/ workshops for RISD, Stony Brook University, the Contemporary Arts Museum-Houston, Berklee College-Valencia, Spain and other institutions this year.

She recently presented new works with the Judd Foundation, Civitella Ranieri Foundation, Museo Centre del Carmen-Valencia, The Kitchen, The Brooklyn Museum and Cervantes Institute. Next year Maria will be artist in residence with the CEC Artslink in St. Petersburg, Russia and Robert Rauschenberg Foundation in Captiva, Florida.

Sougwen Chung

Sougwen Chung explores the mark made-by-hand and the mark made-by-machine as an approach to understanding the interaction between humans and computers. Her organic, maximalist work spans installation, sculpture, still image, drawing, and performance. Her work has been exhibited internationally, including at the Museum of Contemporary Art, Geneva; National Art Center, Tokyo; MIT Media Lab, Cambridge; The Hospital Club, London; Mutek Festival, Mexico City; Sonar Festival, Barcelona. Her recent project, Drawing Operations, is an ongoing collaboration with a robotic arm. The project investigates ideas of automation, autonomy, and collaboration as an exercise in behavioral empathy. In 2016, Chung was the recipient of The Excellence Award from Japan Media Arts Festival for her project Drawing Operations.

Chung's latest exhibition will be at Stonybrook University's Resound, a group exhibition exploring gravitiational waves, as part of F_EAT, exploring fifty years of Experiments in Art and Technology.

Seth Cluett

Seth Cluett is an artist whose work includes installation, concert music, photography, and critical writing. His "subtle...seductive, immersive" (Artforum) sound work has been characterized as "rigorously focused and full of detail" (e/i) and "dramatic, powerful, and at one with nature" (The Wire). His work has been presented internationally at venues such as the Palais de Tokyo, the Whitney Museum, MoMA PS1, STEIM, Apexart, and Eyebeam and is documented on the Line Imprint and Errant Bodies Press as well as Sedimental and Winds Measure Recordings. In the fall of 2015, he joined the faculty of Stevens Institute of Technology where he is jointly appointed in the programs in Visual Arts and Technology and Music and Technology.

Lauren Cornell

Lauren Cornell is curator and associate director, technology initiatives at the New Museum in New York City. In 2015, she co-curated the New Museum Triennial "Surround Audience" with artist Ryan Trecartin. From 2005-2012, she was the Executive Director of Rhizome, an organization dedicated to digital art. Mass Effect, an anthology she co-edited with Ed Halter, published by the New Museum and MIT Press, surveys the past fifteen years of art engaged with the internet and new technologies.

Marco Donnarumma

Marco Donnarumma (PhD) is an artist and writer merging sound art and performance art through science and technology. He is known for his wide range of performances, concerts and installations using and abusing human bodies, sound, infrasound, light, algorithms, body sensors and loudspeakers. He co-founded XTH, a company creating novel modes of expression through technology and the human body. Among other awards, he has been a Harvestworks Fellow with support by the Rockefeller Foundation, and his works have been featured at Sónar+D, ISEA, Venice Biennale, ZKM, transmediale, CTM, FILE, Panorama, NYEAF, Sound Art China, EMPAC, Stanford CCRMA, to name a few.

De Angela Duff

De Angela L. Duff is a designer, photographer, web developer and DJ. She is also the Co-Director of Integrated Digital Media alongside Luke DuBois and Industry Associate Professor at NYU Tandon School of Engineering in Brooklyn. De Angela has spoken at EYEO, NYC Creative Tech Week, Black Portraitures II and II: Revisited, NYC Raising The Bar, AIGA's Social Studies and Massaging Media 2 Conferences and HOW's Annual Design Conference. De Angela holds a MFA in Studio Art (Photography) from MiCA, a BFA in Graphic Design from Georgia State University and a BS in Textile Engineering from Georgia Tech. Her research currently combines music, photography and technology.

Ken Farmer

Farmer founded Wild Dogs International, after 5 years as the Creative Director of Nuit Blanche New York. Previously, he worked with Project for Public Spaces and co-founded DoTank:Brooklyn, a collaborative of urbanists and artists enhancing the city through small-scale change. Throughout his diverse projects, Farmer remains committed to creating site-specific platforms for artists to engage their surroundings through collaborative interventions and sophisticated spectacles.

Artist collaborations include Vito Acconci, Rita Ackermann, Korakrit Arunanondchai, Marco Brambilla, Holly Herndon, Conrad Shawcross, Yves Scherer, and others. His work has been featured in the Venice Architecture Biennale, the New Museum, Palais de Tokyo and under-utilized public spaces throughout New York City.

Paul Geluso

Paul Geluso is a New York based sound engineer, educator, and musician. Frequently collaborating with artists who use sound as creative medium, he has performed, composed electro-acoustic music, and designed unique 3D sound systems that have been exhibited at major art institutions and performance venues internationally. He has worked professionally in many areas of sound and music production being credited as engineer, producer, composer, and musician on hundreds of commercial releases earning 3 Grammy and Latin Grammy nominations. Geluso holds degrees in Electrical Engineering and Music Technology and is currently on the full-time Music Technology faculty at NYU Steinhardt's Department of Music and Performing Arts Professions and the Chief Engineer at Harvestworks Digital Media Arts. His primary area of research is in 3D audio recording techniques, processing, and playback systems.

Zev Greenfield

Zev Greenfield is a not-for-profit arts manager, fundraiser and strategist with an MBA from Columbia Business School and over 15 years of progressive global experience across the not-for-profit, arts/entertainment and finance industries. He is recognized for his commitment to artists, devising new and inventive programming initiatives, leading the construction of The DiMenna Center for Classical Music - NY's first orchestral rehearsal and recording studio, fundraising for both operating and capital projects and completing a turnaround the Byrd Hoffman Water Mill Foundation in 2013/14. In late 2015, Zev was appointed the Executive Director of ISSUE Project Room, a pioneering Brooklyn-based performance center.

HAMMERSTEP (Garrett Coleman and Jason Oremus, Founding Directors)

HAMMERSTEP is an award-winning dance and production company based in Brooklyn featuring an original dance form fusing Irish, hip hop, stepping, and martial arts. The company has toured to international acclaim since 2009 and includes world champion dancers, Grammy-winning composers, and production personnel from some of the world's biggest shows.

HAMMERSTEP's latest endeavor is a site-specific, digitally immersive walkthrough experience called INDIGO GREY. Based in the post-apocalyptic future, it features a choice-based narrative in which the audience becomes the main character, fully enveloped by animated projection mapping, responsive tech elements, the group's signature dance style, and a live soundscape.

Harvestworks (Carol Parkinson, Executive Director)

Founded by artists in 1977, Harvestworks is a leader in the art and technology field, educating, commissioning and producing work by composers, sound, visual and multi-disciplinary artists that reach an ever-expanding and receptive audience. The T.E.A.M. (Technology, Engineering, Art and Music) lab is a unique facility that offers technical expertise and resources to support the artist in the creation of new work. Creativity + Technology = Enterprise Program fosters an entrepreneurial spirit that encourages artists to consider new business models to sustain their practice and develop their careers. In line with the historical E.A.T. (Experiments in Art and Technology) Harvestworks provides an environment for experimentation with technicians, instructors, and innovative practitioners in the electronic arts. Former residents, who have used new technology in their art include established artists Christian Marclay, Luke Dubois. Pauline Oliveros and Cory Arcangel. Presented by Executive Director Carol Parkinson.

James Hoff

James Hoff is an artist living and working in Brooklyn, NY. His work encompasses painting, sound, writing, performance, and publishing among other media. He has maintained a strong focus on distributed forms and experiments with language, including cross-disciplinary investigations that address orally-transmitted syndromes, computer viruses, and ear worms. His recent works have sought to reconcile traditional forms with the technological advances that underscore our contemporary lived experience. Hoff is also a co-founder of Primary Information, a non-profit arts organization devoted to publishing artists' books and art historical documents.

Tom Igoe

Tom Igoe is an Arts Professor at NYU's Interactive Telecommunications Program (ITP) in the Tisch School of the Arts. His research interests include physical interaction design, networks, and sustainability in technology development. He has written four books for makers and he is an occasional contributor to Make magazine. He is a co-founder of the Arduino open source microcontroller environment. He has consulted on interacton design for various museums and interactive design companies. He is currently living a personal dream of working with monkeys, and wants to visit Svalbard someday.

Julia Kaganskiy

Julia Kaganskiy is Director of NEW INC, the New Museum's incubator for art, design and technology, a groundbreaking initiative founded in 2014. She previously served as Global Editor of The Creators Project, a partnership between VICE Media Group and Intel, and founded #ArtsTech Meetup, a group that brings together professionals from New York City's museums, galleries, art-related start-ups, and digital artists. She has been cited as one of Crain's New York "40 Under 40" (2015), named one of the most influential women in technology by Fast Company (2011) and Business Insider (2013) and profiled in the 2012 AOL/PBS series MAKERS honoring women leaders.

Mari Kimura

Mari Kimura is a violinist/composer on faculty at Juilliard, a winner of Guggenheim Fellowship, Fromm Commission from Harvard and a residency at IRCAM in Paris. Decorated with numerous grants including NYSCA and Rockefeller Brothers Fund, she is well-known for her ground-breaking "Subharmonics" and her work with interactive computer, and since 2013 serves as the Director of "Future Music Lab" at the Atlantic Music Festival. Mari will give an easy-to-understand demonstration of "μgic" (pronounced "Mu-zhik") a new wireless WiFi sensor for sound and visuals. "μgic" project is supported by ITAC.org with NYSCA, Governor Cuomo and the NY State Legislature and The Rockefeller Foundation's NYC Cultural Innovation Fund.

Charles Lindsay

Charles Lindsay is a multi-disciplinary artist working with technology and eco-systems. His FIELD STATION is currently installed at MassMoCA. Lindsay is the SETI Institute's A.I.R. Program Director, a Guggenheim Fellow, and the innovator behind OSA EARS – a project designed to stream high resolution sound and climate data from one of the Earth's most bio-diverse rain forests, located on Costa Rica's OSA peninsula. ECOTONE is the contemporary art environment conceived to immerse viewers in a real time audio visual point cloud, from OSA EARS, so that nature and technology are experienced as dynamic simultaneous networks.

Denise Markonish

Denise Markonish is the curator at MASS MoCA, where her exhibitions include Explode Every Day: An Inquiry Into the Phenomena of Wonder; Jim Shaw: Entertaining Doubts; Teresita Fernandez: As Above So Below; Oh, Canada, the largest survey of contemporary Canadian art; Nari Ward: Sub Mirage Lignum; Inigo Manglano-Ovalle: Gravity is a force to be reckoned with; These Days: Elegies for Modern Times and Badlands: New Horizons in Landscape. She has taught at Williams College and the Rhode Island School of Design and is the head of the advisory committee for the SETI Institute's artist in residence program.

Julie Martin

Julie Martin joined the staff of E.A.T. in 1967, and over the years worked closely with Billy Klüver and Robert Rauschenberg on projects and activities of the nonprofit organization.
 Currently she is Director of E.A.T. and Executive Producer of a series of video films that document each of the ten artists' performances at the 1966 9 Evenings: Theatre & Engineering. She is also coordinating producer for Robert Whitman's video cell phone performances and theater performances using projections and Internet connectivity. She is editing a book on the art and technology writings of Billy Klüver.

Courtney McKenna

Courtney McKenna is an artist and curator from Tucson, AZ. She earned her degree in Retailing and Consumer Science from the University of Arizona in 2009. In 2012 she began making costumes and managing talent for Ami Goodheart and SOTU Productions. That same year she started making optical-wearable art. In 2013 she co-founded Collective Craft which created environmental installations, collaborating with artists from around the world. This led her to become the Director of Development for community art space The Vazquez Building in 2014. There she programmed over 20 shows in just six months.

Courtney continues to create environmental installations and costumes for her company LUMA - Spread Light as well as for her work in Experiential Marketing with Cunning NYC. She is fascinated with light, perception and consciousness which are recurring themes in her work.

Eliza McNitt

Eliza McNitt found filmmaking through science. A top winner of the Intel Science Fair for her research on Honeybee Colony Collapse Disorder, Eliza's first film Requiem for the Honeybee followed the mystery of vanishing honeybees and was broadcast internationally on C-Span. Her unique voice as a director fusing science with narrative storytelling has been supported by The Alfred P. Sloan Foundation, Global Dialogues, TED, and Google. At NYU's Tisch School of the Arts, Eliza was the winner of an Alfred P. Sloan Foundation Production Grant for her film Without Fire which was filmed on the Navajo Reservation in Arizona, starring the late Misty Upham (Frozen River, August: Osage County). Eliza then developed a comedic series with Google to empower women to learn to code. She is currently creating a Virtual Reality experience following the journey of The Hubble Telescope through the cosmos in collaboration with National Sawdust.

Daniel Neumann

Daniel Neumann is a Brooklyn-based sound artist, organizer and audio engineer, originally from Germany. He holds a master's degree in media art from the Academy of Visual Art Leipzig and also studied electronic music composition under Emanuele Casale in Catania, Italy. In his artistic practice he is using conceptual and often collaborative strategies to explore sound, sound material and its modulation through space, situation and media. Curatorially he runs an event series in NYC and Berlin (CT::SWaM:: http://ctswam.org/) that engages in spatial sound works and focused listening.

Lisa Park

Lisa Park is an artist who has been working with biofeedback technology to display physiological measurements as auditory and visual representations. Heartmonic is an interactive performance piece that uses the bodies of participants as instruments, turning their heartbeats into a symphonic ensemble in real time. Heart rate sensors are connected to each of the eight participants, and their heart rhythms are converted to sound. The aim of Heartmonic is to share mutual exchange of experience and build emotional bonds between the participants. The artist guides the participants in both physical and emotional activities designed to provoke their feelings.

Mike Philson

Mike "President Philson" is CEO and Founder of MMP Guided Entertainment. As an international recording artist, songwriter and producer, writer, actor and filmmaker from Plainfield, New Jersey, Philson's communicative art embodies the struggles, hopes, and dreams that make life worth living. Through music, film, writing, and fashion, Philson shares entertaining stories of enlightenment, perseverance, and faith.

Philson studied Government at Harvard and was an on-campus cultural and civic leader, as well as an entrepreneur. He has a diverse set of experiences ranging from Investment Banking on Wall Street, Management Consulting in Private Equity and Technology, to running a global urbanwear fashion line sold in leading retailers and modeling for high-end brands, as well as educational mentoring and community leadership. He has recently Co-Founded Banana Wave Banana Milk, the #1 new non-dairy milk in efforts to make humanity healthy, and the Made in NWK/Sociosmith Community Development Initiative to develop Newark 3.0 and Newark as America's next great tech hub. His #Jerseygrown Foundation serves organizations assisting 50,000 children globally and over 21,000 in New Jersey.

Philson has spoken at numerous engagements including industry-leading Conferences from Finance to Branding, Hip-Hop, entrepreneurship, Politics, and engaging communities. Philson is a leader in the Harvard Alumni Network, and is considered one of the new faces of the Civil Rights Movement as a recent NAACP Chair

of Community Affairs and Education and leader of the Global Black Student Orientation Summit in Newark, NJ, as well as Founding Minister of C4 Global Community. President Philson is a man of the people and steward of humanity and the arts.

Lauren Rosati

Lauren Rosati is a PhD Candidate in Art History at the CUNY Graduate Center where she is completing her dissertation on sound technologies and the interwar avant-garde, with a chapter on Bell Labs' collaborations with conductor Leopold Stokowski in the 1930s. She is also co-organizing (with Chris McIntyre) a series of programs for Brooklyn-based non-profit ISSUE PROJECT ROOM to celebrate the fiftieth anniversary of "9 Evenings: Theatre and Engineering" (1966), which united artists, engineers, and technologists for multimedia performance projects.

Michelle Rosenberg

Michelle Rosenberg is an artist and architect based in New York City. Her artistic practice incorporates many mediums including drawing, sculpture, sound and installation. She explores the basic building blocks of language and the rules of communication, highlighting their fluidity and digressive applications. Examples of previous projects include musical instruments hidden in walls, kiosks for human/bird communication, and several site-specific object-alphabets. Her work has recently been exhibited at the Kuandu Museum of Art in Taipei, Taiwan; Louis B James Gallery in New York, NY; and at the Royal College of Art in London, UK.

Ben Rubin

Artist and designer Ben Rubin is the Director of the Center for Data Arts at The New School in New York. His projects have been presented at museums and performance venues around the world. Rubin's collaborations with statistician Mark Hansen include Moveable Type (2007), a permanent artwork for the lobby of the New York Times building, and Listening Post (2002), which Hansen and Rubin originated at Bell Labs in 1999. Rubin's projection design for Arguendo, a play by Elevator Repair Service, earned him an Obie Award in 2014. Rubin received his BA in Computer Science and Semiotics from Brown University in 1987, and his MS Vis. from the MIT Media Lab in 1989.

Roderick Schrock

Roderick is responsible for strategic and operational leadership at EYEBEAM. He is an active digital artist, having presented work at the Kennedy Center for the Arts, SFMoMA, Super Deluxe (Tokyo), RedCat Theater, Hammer Museum (Los Angeles). He has toured, spoken, and curated widely.

His essays have been published by MIT Press and appear regularly on Huffington Post. He is adjunct faculty at NYU's Interactive Telecommunications Program and sits on the Netherland-America Foundation Cultural Commission as well as the Board of Curatious. Adam Shore.

Adam Shore

Adam Shore oversees North American activities for the Red Bull Music Academy including events and the NYC festival. He is the creator of The Blackened Music Series and Tinnitus Music Series. Previously GM of VICE Records, artist manager, and music liaison for brands, Adam has worked with independent artists for over 20 years.

Julia Sinelnikova

Julia Sinelnikova is an interdisciplinary artist who works with holograms, performance, and digital culture. Her light installations have been exhibited internationally, and she has performed widely as The Oracle of Vector Gallery. She has received commissions from Pace University, SELECT Fair, and Norte Maar. Her work has been presented at the Contemporary Art Museum of Houston, The Oulu Museum of Art, and The Vazquez Building. Sinelnikova has also developed site-specific installations for Miami Art Week annually since 2011. She holds a BFA in Sculpture from The Fashion Institute of Technology (SUNY). She lives and works in Brooklyn.

Doug Slocum

Bell Telephone Laboratories' VODER (Voice Operating Demonstrator) was the first attempt to electronically synthesize human speech by breaking it down into its acoustic components. While speech quality was limited, it demonstrated manual synthesis of the human voice was possible. Invented by Homer Dudley in 1937–1938, it expanded upon his earlier work on the vocoder, which was used in voice communications for security and to save bandwidth.

While VODER's original equipment rack has survived, the location of the original operator console is unknown. Nokia Bell Labs commissioned Doug Slocum, of Synthetic Sound Labs, to design and build this functioning replica.

Ysanne Spevack

I am a composer/experiential designer making the invisible visible in my cross-modal immersive activation, YNTEGRITY.

I am excited to explore collaborative practices with Nokia Bell Labs focusing on design for speculative futures, i.e. for how the world could become, rather than how the world is likely to become.

I'm interested in less pragmatic solutions, more whimsical open-sourced realities, for example possible futures where spirit is equally directive for policy as science, or where our dreams and are of equal value as waking reality.

More Alice in Wonderland than Fox News. More spiritual awakening than business as usual.

Dennis Szakacs

Dennis Szakacs is the Associate Director, Institutional Advancement, at the New Museum, NYC where he oversees all finance and development-related activities, and business planning for both earned and contributed income. From 2003 to 2013, Szakacs was Director and CEO of the Orange County Museum of Art in Newport Beach, California, where he elevated the institution's national and international profile through distinguished exhibitions and a significant touring program. He also doubled the museum's operating budget and substantially increased its endowment.

Jeff Thompson

Jeff Thompson is an artist, programmer, hacker, and educator based in the NYC area. He is currently Assistant Professor and Program Director of Visual Art & Technology at the Stevens Institute of Technology in Hoboken, New Jersey, as well as artist-in-residence at Bell Labs.

Thompson has exhibited and performed his work internationally at venues including the Museum of the Moving Image, Sheldon Museum of Art, the Taubman Museum of Art, SITE Santa Fe, Bemis Center for Contemporary Art, the Jersey City Museum, and the Weisman Art Museum. Recent commissions include Abandon Normal Devices, Brighton Digital Festival, Rhizome, Turbulence, and Harvestworks. In addition to his studio practice, Thompson curates exhibitions through Drift Station, a curatorial collaboration that mounts international, experimental exhibitions.

VOLVOXLABS (Pa Her and Kamil Nawratil)

VOLVOXLABS [VVOX] uses dynamic motion graphics, lighting, fabrication and new media technologies to help artists and brands connect with audiences through creative innovation.

First creating high-end cinematic content for music festivals, and then to new media responsive environments, the VVOX team combines video, sound, architecture and visual effects within dynamic physical spaces and custom built structures. Proficient at solving high-tech problems, VVOX has worked with award winning artists, entertainers and iconic brands.

Andrea Wolf

I am a Chilean-born interdisciplinary artist living and working in New York. My work consists of ongoing research into the relationship between personal memory and cultural practices of remembering. I am interested in memory objects we produce such as photographs, home movies, and postcards. I create multimedia installations that explore how technology, media and memory affect and transform each other. Working with an archive of found footage with anonymous stories - I leave an open space to be filled by the meaning that each of us brings through our personal experiences. My installations are places in which memory becomes an action that is constantly actualized in the present.

Karen Wong

Karen Wong is the Deputy Director of the New Museum, NYC. She cofounded the initiatives IDEAS CITY which explores the future of cities with the belief that art and culture are essential to our metropolises, and NEW INC, the first museum-led incubator for art, technology and design. She was the managing director of David Adjaye Associates from 2000-2006 and supports emerging architects in her role as a board member of Plus Pool. She sits on the boards of Rhizome and Apex for Youth and the advisory board of National Sawdust.

Nokia Bell Labs Demos

Human Digital Orchestra™

The Bell Labs Human Digital Orchestra System (HDO) is a distributed, network-based multimedia processing and performance system that has been the foundation of two recent public events: "The Shannon Effect," a mixed-media retrospective; and "Beatie Wolfe in Concert with HDO," an augmented musical performance. Today's HDO demonstration features three parts, which together convey both the breadth and depth of the system's capabilities. "Sonification of Public Spaces" illustrates the conversion of live motion to multipart music. "Video-Controlled Spatial Audio" allows a participating crowd to command a musical program within the venue. Lastly "Portable Video Processing" shows how a simple device can join with HDO to produce larger results.

Light Painting

Invisible wireless signals permeate our surroundings, enriching our digital lives. We make the invisible visible by encoding the ambient WiFi signal strength onto a hand-held array of colored LEDs. By coupling human locomotion with long exposure photography, we can reveal the undulations of this ethereal world.

Painting with Wifi at Bell Labs Ireland

Virtual Reality

Explore an immersive experience placing you inside an artistic performance, with a 360 degree view of the performers and the audience. We recorded live experiences using the 8 cameras and multiple microphones embedded within the celebrated Nokia OZO virtual reality camera, a new motion picture quality platform recently introduced and still in development. We have converted the immerse experience into a format playable on a Samsung Gear VR headset for your enjoyment.

A New Era of Wireless Communication

For the first time since Marconi's wireless experiment in 1895, we are moving from broadcast-style communication to directed-beam communication using mm-Wave phased arrays. The W-Band phased array chipset from Bell Labs is capable of delivering multi-gigabyte per second of data to multiple targets. A single-chip phased array ASIC and PCB-embedded antenna arrays have been developed for these experiments.

The Nokia OZO Virtual Reality camera

Enabling Robotic Automation and Collaboration

Today robotic machines are typically fixed in locations and operate in relative isolation of each other, executing specialized tasks. However, in the near future, robots will become mobile and will therefore need to react to a diverse array of changing conditions, as well as to interact with each other to collaborate in real-time to perform complex tasks.

In this live demonstration, three robots are in constant communication to keep a ball on a plate which is being balancing between them. A camera is capturing the position of the ball which is sent to a centralized controller. The controller is sending and receiving commands via our ultra-robust low latency 5G network that supports fast, flexible communications between machines/robots and their control function in the cloud. By obtaining real-time continuous task level data for each robot or machine, we are able to recognize and react to perturbations to the systems, preventing loss of control or an accident (dropping the ball in this case).

In synch

Industrial grade unified ICT infrastructure

Core

Embedded Intelligence

Edge Intelligence

Centralized Intelligence

"Artificially intelligent" production system

Logic control/ Motion control

5G factory cloud

Mobility mgmt.

SDN

Product data

Service data

Engineering data

Order data

Supply chain data

Operational data

Usage data

NOKIA Bell Labs