thrive
SIGGRAPH2019
LOS ANGELES • 28 JULY – 1 AUGUST

COMPUTER ANIMATION FESTIVAL

Welcome to the SIGGRAPH 2019 Computer Animation Festival!

The conference is a time to celebrate achievements, encounter the latest advancements, and collaborate on new ideas. Use this program as a guide for the Electronic Theater, VR Theater, Production Sessions, and Real-Time Live! But, that is just the first step! Our expert juries had the enormous responsibility of selecting the line-ups being presented at the conference and we invite you to experience each element firsthand throughout the week.

Monday's one-night-only event at Microsoft Theater will be an extravaganza of state-of-the-art visuals. Recognized as a qualifying festival for the Academy Awards, the Electronic Theater is a can't-miss, international showcase of animated short films, visual effects reels, scientific visualizations and illustrations, advertisements, and more (see page: 8). Remember to vote for your favorite for the Audience Choice Award via the SIGGRAPH 2019 mobile app.

The ever-popular VR Theater is back and bigger than ever with more screening opportunities per day and more seats per screening! Five experiences have been combined to create a single, one-hour program (see page: 14). Kiosks also return with selections that exhibit diverse experimentation and storytelling (see page: 15).

It's not SIGGRAPH without showing you the "how." Production Sessions offer behind-the-scenes looks at some of the most significant productions in film, cable, streaming, games, and VR. Attendees will have opportunities to hear from creators behind monumental projects, some of which are — quite literally — "out of this world" (see page: 18). And, don't forget to check out the Production Gallery, now in its third year!

Finally, Tuesday's Real-Time Live! will demonstrate how real-time technology is revolutionizing the way we interact in an increasingly connected society. Presenters will share innovative applications in robotics, ray tracing, AI, and beyond (see page: 24). At the end of the show, have YOUR say by voting in Real-Time Live's inaugural Audience Choice award...live!

Time at SIGGRAPH may go by quickly, but the learnings and connections made here will help us all continue to THRIVE year-round. Enjoy SIGGRAPH 2019!

Emily Hsu
Computer Animation Festival Director

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Committee & Jury

COMPUTER ANIMATION FESTIVAL

ELECTRONIC THEATER

SIGGRAPH 2019 Computer Animation Festival Director
Emily Hsu
Blizzard Entertainment

Electronic Theater Jury

John Craney
LAIKA

Everett Downing, Jr.
Netflix Animation

Darin Grant
Animal Logic

Amy Hennig

Helen-Nicole Kostis
NASA

Jason McConnell
Nickelodeon Animation

Silvia Olivas
Netflix Animation

Electronic Theater Committee

Aron Anderson
Walt Disney Imagineering

Matt Costa
Riot Games

Siva Kumar

Christina Mackin
LAIKA

SIGGRAPH 2020 Computer Animation Festival Director
Munkhtsetseg Nandigjav
Savannah College of Art and Design

Vib Soundrarajah
Halton Region

Justin Tennant
Walt Disney Animation Studios

PRODUCTION SESSIONS

SIGGRAPH 2019 Production Sessions Chair
Derrick Nau
DreamWorks Animation

Production Sessions Committee

Marie-Soleil Chabot
DreamWorks Animation

Chris Gallagher
Savannah College of Art and Design

Casey Kwock
Outright Games

Angel Lam
XSV

REAL-TIME LIVE!

SIGGRAPH 2019 Real-Time Live! Chair
Gracie Arenas Strittmatter
Electronic Arts / BioWare

Real-Time Live! Jury

Volga Aksoy
Oculus

Kleber Garcia
Electronic Arts - Frostbite

Saskia Groenewegen
Ordina

Arthur Homs
Microsoft

Yibing Jiang
Unity Technologies

Inigo Quilez

Real-Time Live! Committee

Unai Landa
Digital Legends

Ana Cecilia Balliache Liendo
Schell Games

Jenny Liu
Blizzard Entertainment

Elizabeth Longoria
Our Lady of the Lake University

William McDonald
AWS Thinkbox

SIGGRAPH 2020
Real-Time Live! Chair
Marc Olano
University of Maryland, Baltimore County

VR THEATER

SIGGRAPH 2019
VR Theater Director
Maxwell Planck
Adventure Lab

Immersive Jury

Lisa Bell
NVIDIA

Camille Cellucci
The VOID

Larry Cutler
Baobab Studios

Ikrima Elhassan
Kite & Lightening

Natalie Grant
Unity Technologies

Foo Hoang
HTC Corporation

June Kim
UNSW Art & Design

Amy La Meyer
WXR Fund

Javier Molina
Lightbox Animation Studios

Tom Sanocki
Facebook

Ollie Shaw
Apple

Laura Trutoiu
Magic Leap

Saschka Unseld
Passion Pictures

Bruce Wooden

VR Theater Committee

Thoufeeq Amahed
PrecisionOS

Mateo Cano
MPC

SIGGRAPH 2020
VR Theater Director
Monica Cappiello
Cogswell

Marco Cermusoni
Kre.is | Centre for Digital Media

Carlos Diaz-Padron
Lunacy

Youhan Guan
Blackbird Interactive

John Gwinner
Author, CTO4you.com

Yangos Hadjiyannis
Kre.is | Centre for Digital Media

Maria Jose Herrera
Industrial Light & Magic

Ana Cecilia Balliache Liendo
Schell Games

Sherry Li
CTUS Audio

Conrad Sly
uForis

Yao Wang
ICTUS Audio

Jimmz Zhang
Digital FUN

Festival Schedule

SUNDAY, 28 JULY

1:15 pm – 2:30 pm	VR Theater (Full Conference Platinum attendees only), South Hall J
1:30 pm – 5:30 pm	Production Gallery, Concourse Foyer VR Theater Kiosks, South Hall J
2:15 pm – 3:30 pm	VR Theater (Full Conference Platinum attendees only), South Hall J
3:15 pm – 5:30 pm	VR Theater (Full Conference Platinum attendees only), South Hall J
4:15 pm – 5:30 pm	VR Theater (Full Conference Platinum attendees only), South Hall J

MONDAY, 29 JULY

8:45 am – 10:00 am	VR Theater, South Hall J
9:45 am – 11:00 am	VR Theater, South Hall J
10:00 am – 5:30 pm	Production Gallery, Concourse Foyer VR Theater Kiosks, South Hall J
10:45 am – 12:00 pm	VR Theater, South Hall J
11:45 am – 1:00 pm	VR Theater, South Hall J
1:45 pm – 3:00 pm	VR Theater, South Hall J
2:45 pm – 4:00 pm	VR Theater, South Hall J
3:45 pm – 5:00 pm	VR Theater, South Hall J
3:45 pm – 5:15 pm	The Making of Marvel Studios' 'Avengers: Endgame', West Hall B
6:30 pm – 8:35 pm	Electronic Theater*, Microsoft Theater

*Awards presentation begins at 6:15 pm. **Pre-show presentation begins at 5:40 pm*

TUESDAY, 30 JULY

8:45 am – 10:00 am	VR Theater, South Hall J
9:45 am – 11:00 am	VR Theater, South Hall J
10:00 am – 5:30 pm	Production Gallery, Concourse Foyer VR Theater Kiosks, South Hall J
10:45 am – 12:00 pm	VR Theater, South Hall J
10:45 am – 12:15 pm	Disney Presents: The Making of 'The Lion King', West Hall B
11:45 am – 1:00 pm	VR Theater, South Hall J
1:45 pm – 3:00 pm	VR Theater, South Hall J
2:00 pm – 3:30 pm	Step Right Up, Everyone's a Winner – The Making of 'Toy Story 4', West Hall B
2:45 pm – 4:00 pm	VR Theater, South Hall J
3:45 pm – 5:00 pm	VR Theater, South Hall J
3:45 pm – 5:15 pm	'How to Train Your Dragon': The Hidden What?, West Hall B
6:00 pm – 7:45 pm	Real-Time Live!**, West Hall B

WEDNESDAY, 31 JULY

8:45 am – 10:00 am	VR Theater, South Hall J
9:45 am – 11:00 am	VR Theater, South Hall J
10:00 am – 5:30 pm	Production Gallery, Concourse Foyer VR Theater Kiosks, South Hall J
10:45 am – 12:00 pm	VR Theater, South Hall J

Festival Schedule

10:45 am – 12:15 pm   Creating the Immersive World of BioWare's 'Anthem', West Hall B

11:45 am – 1:00 pm   VR Theater, South Hall J

1:45 pm – 3:00 pm   VR Theater, South Hall J

2:00 pm – 3:30 pm   'Space Explorers: Life in Orbit' – Filming VR in Microgravity, West Hall B

2:45 pm – 4:00 pm   VR Theater, South Hall J

3:45 pm – 5:00 pm   VR Theater, South Hall J

3:45 pm – 5:15 pm   The VFX of Netflix Series, West Hall B

6:30 pm – 8:00 pm   For the Throne – The Making of 'Game of Thrones': Season 8, West Hall B

THURSDAY, 1 AUGUST

8:45 am – 10:00 am   VR Theater, South Hall J

9:45 am – 11:00 am   VR Theater, South Hall J

10:00 am – 3:30 pm   Production Gallery, Concourse Foyer
VR Theater Kiosks, South Hall J

10:45 am – 12:00 pm   VR Theater, South Hall J

10:45 am – 12:15 pm   'First Man': Redefining In-Camera FX, West Hall B

12:45 pm – 2:00 pm   VR Theater, South Hall J

1:45 pm – 3:00 pm   VR Theater, South Hall J

2:00 pm – 3:30 pm   'Alita: Battle Angel' – The Art of Being Human, West Hall B

3:45 pm – 5:15 pm   Swing into Another Dimension: The Making of 'Spider-Man: Into the Spider-Verse', West Hall B
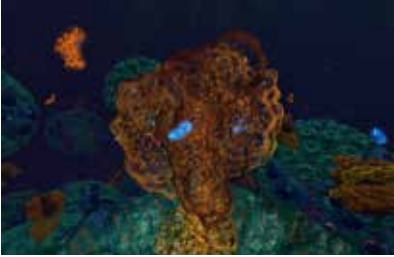
Electronic Theater

"Birth of Planet Earth" Fulldome Excerpt: Photosynthesis in a Chromatophore
Donna Cox

Advanced Visualization Lab, National Center for Supercomputing Applications, University of Illinois at Urbana-Champaign | United States

Game Changer
Aviv Mano

Ringling College of Art and Design | United States

The Bolt Connection
Nicolas Lebas

Supinfocom Rubika | France

Old Soldier
Marc Messenger

Blizzard Entertainment | United States
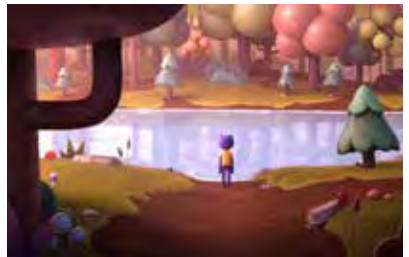

Hedgehog
Vaibhav Keswani

GOBELINS, l'école de l'image | France

Stuffed
Élise Simoulin

Supinfocom Rubika | France

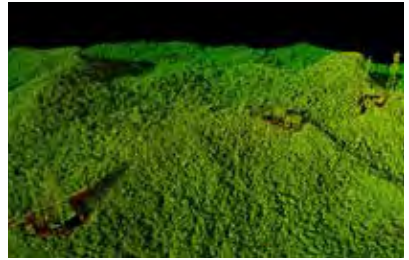## The Making of "How to Train Your Dragon: The Hidden World"
Dave Walvoord

DreamWorks Animation | United States

Passage
Igor Coric

Artrake | Serbia

Share Your Gifts
Buck

Buck & TBWA\Media Arts Lab | United States

NASA Surveys Hurricane Damage to Puerto Rico's Forests
Alex Kekesi

GST, Inc. - NASA/Goddard Space Flight Center | United States

Purl
Kristen Lester

Pixar Animation Studios | United States

Best Friend
Nicholas Olivieri

GOBELINS, l'école de l'image | France

Electronic Theater

Alita: Battle Angel
Eric Saindon

Weta Digital | New Zealand

Mayday – Final Chapter
Muh Chen

Grass Jelly Studio | Taiwan

Expedition Reef for Educators
Ryan Wyatt

California Academy of Sciences | United States

Kinky Kitchen
Bea Hoeller

Filmakademie Baden-Württemberg GmbH, Animationsinstitut | Germany

The Heretic (Part 1)*
Veselin Efremov

Unity Technologies | Denmark

The Tree
Basil Malek-Abuhamdan

GOBELINS, l'école de l'image | France

Wild Love
Maryka Laudet
École des Nouvelles Images | France

The Stained Club
Mélanie Lopez
Supinfocom Rubika | France

ILM 2019 – Behind the Magic*
Brent Segura-Bowers
Industrial Light & Magic | Canada, Singapore, United States, United Kingdom

Marooned
Andrew Erekson
DreamWorks Animation | United States

The Ostrich Politic
Mohammad Houhou
GOBELINS, l'école de l'image | France

Spider-Man: Into the Spider-Verse
Danny Dimian
Sony Pictures Imageworks | United States

*Indicates curated work not reviewed by the jury.

Electronic Theater Awards

Best In Show

Purl

Kristen Lester | *Pixar Animation Studios* | *United States*
"Purl," directed by Kristen Lester and produced by Gillian Libbert-Duncan, features an earnest ball of yarn named Purl who gets a job in a fast-paced, high energy, bro-tas-tic startup. Yarn hijinks ensue as she tries to fit in, but how far is she willing to go to get the acceptance she yearns for, and in the end, is it worth it?

Jury's Choice

The Stained Club

Mélanie Lopez | *Supinfocom Rubika* | *France*
Finn has stains on his skin. One day, he meets a group of cool kids with different stains on their bodies. One day, he understands that these stains aren't just pretty.

Best Student Project

Stuffed

Élise Simoulin | *Supinfocom Rubika | France*
An emotionally unstable cat makes a strange encounter that helps him grow up and learn to overcome his anger.

VR Theater

SCREENINGS

Doctor Who: The Runaway
Mathias Chelebourg
BBC VR Hub, BBC Doctor Who, Passion
Animation Studios | United Kingdom, France

a kite's tale
Bruce Wright
Walt Disney Animation Studios | United States

Kaiju Confidential
Ethan Shaftel
easyAction, ShadowMachine | United States

2nd Step
Joerg Courtial
Faber Courtial | Germany

Bonfire
Larry Cutler, Wei Wang
Baobab Studios | United States

KIOSKS

1inch VR
Yong Hwan Kim
M2S | South Korea

the bOnd
Olly Reid
Axis Studios | United Kingdom

Age of Sail
John Kahrs
Boathouse Studios, Google Spotlight
Stories | United States

Children Do Not Play War
Fabiano Mixo
VILD Studio | Brazil

Ghost Fleet VR
Lucas Gath
Catovia LLC | United States

VR Theater

KIOSKS

The Great C
Steve Miller
Secret Location | Canada

MindPalace
Carl Krause, Dominik Stockhausen
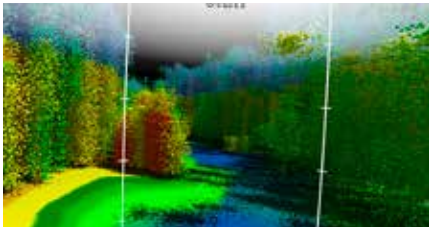*Filmakademie Baden-Württemberg | Germany*

Inside Hurricane Maria in 360 Degrees
Gregory Shirah
NASA/GSFC — Scientific Visualization
Studio | United States

Traveling While Black
Roger Ross Williams
Felix & Paul Studios | Canada

Jurassic World: Blue
Felix Lajeunesse, Paul Raphael
Felix & Paul Studios | Canada

Production Sessions

The Making of Marvel Studios' 'Avengers: Endgame'
Monday, 29 July, 3:45 pm – 5:15 pm, West Hall B

The fourth installment in the Avengers saga is the culmination of 22 interconnected films and has drawn audiences to witness the turning point of this epic journey. Our beloved heroes now truly understand how fragile our world is and the sacrifices that must be made to protect it. It is a story of friendship, teamwork, and setting aside our differences to overcome an immense obstacle.

Join Marvel Studios, Digital Domain, ILM, and Weta Digital as they discuss how the most diverse collection of heroes, environments, and visual effects were assembled into this ultimate, climactic final chapter.

Panelists:

Victoria Alonso, *Marvel Studios*

Dan DeLeeuw, *Marvel Studios*

Jen Underdahl, *Marvel Studios*

Kelly Port, *Digital Domain*

Russell Earl, *Industrial Light & Magic*

Matt Aitken, *Weta Digital*

Gerardo Ramirez, *The Third Floor*

Disney Presents: The Making of 'The Lion King'
Tuesday, 30 July, 10:45 am – 12:15 pm, West Hall B

In this session, VFX Supervisor Rob Legato will reveal the creative and technical challenges behind bringing Director Jon Favreau's re-imagination of Disney's "The Lion King" to life. The magical visual effects and animation of "The Lion King" were created by global VFX studio MPC Film, which harnessed the latest filmmaking technologies and creative talent to help bring Favreau's vision of "The Lion King" to a new generation. As the sole provider of visual effects and animation, the MPC team was led by VFX supervisors Adam Valdez and Elliot Newman, who worked closely with Legato and Animation Supervisor Andy Jones, crafting every photoreal frame of the movie.

Panelists:

Rob Legato, *ASC*

Caleb Deschanel, *ASC*

Step Right Up, Everyone's a Winner – The Making of 'Toy Story 4'
Tuesday, 30 July, 2:00 pm – 3:30 pm, West Hall B

"Toy Story 4" continues the rich history of the previous three films, while also expanding the world and exposing the characters to new and exciting challenges. For Woody, a journey far beyond the kids' rooms and neighborhoods he's always known introduces him to new faces that test his assumptions of what it means to be there for a child. And, of course, he'll need the help of some old friends to navigate the adventures he encounters. In this session, the crew will discuss how the sets, characters, cinematography, and even pipeline were all developed to celebrate this next chapter. Please keep your hands inside the ride at all times.

Panelists:

Bob Moyer, *Pixar Animation Studios*

Bill Reeves, *Pixar Animation Studios*

Derek Williams, *Pixar Animation Studios*

Thomas Jordan, *Pixar Animation Studios*

Steve Karski, *Pixar Animation Studios*

Sajan Skaria, *Pixar Animation Studios*

Amy Jones, *Pixar Animation Studios*

Ariela Fedorov, *Pixar Animation Studios*

'How to Train Your Dragon': The Hidden What?
Tuesday, 30 July, 3:45 pm – 5:15 pm, West Hall B

"How to Train Your Dragon: The Hidden World" represents the final installment of the Dragon trilogy, whose releases span nine years, during which technology changed dramatically. The filmmakers will discuss how the third film evolved to embrace new technology, particularly physically based rendering and improved simulation capabilities, while remaining true to the design principles established in the first movie.

It was critical to the storytelling that the Hidden World — home of the dragons — needed to be expansive and endless, despite being underground. It needed to be rooted in the naturalistic style of the franchise, yet feel alien to our human world. We will discuss the creative design challenges and technical hurdles faced in bringing this world to life.

Due to the introduction of new software and pipeline, built on USD, as well as schedule challenges, the production process resembled less of our traditional linear pipeline typical of feature animation production, with much more back-and-forth between departments working at the same time. The panelists will explore how this "controlled chaos" that characterized production of "The Hidden World" impacted the final film.

Panelists:

Dave Walvoord, *DreamWorks Animation*

Lawrence Lee, *DreamWorks Animation*

Munira Tayabji, *DreamWorks Animation*

Paolo deGuzman, *DreamWorks Animation*

Pablo Valle, *DreamWorks Animation*

Chris De St. Jeor, *DreamWorks Animation*

Production Sessions

Creating the Immersive World of BioWare's 'Anthem'
Wednesday, 31 July, 10:45 am – 12:15 pm, West Hall B

The savage world of "Anthem" is volatile, lush, expansive, and full of unexpected characters. Bringing these aspects to life in a real-time (30 fps), interactive environment presented a wealth of challenging problems for BioWare's technical artists and rendering engineers. These developers work with content creators to bridge art and technology through creative problem solving in areas such as performance/runtime, shaders, and artist tools. This retrospective panel will highlight some of the team's work alongside reflections on innovation, distributed collaboration/coordination, and the successes and challenges of creating a new IP for the world to enjoy.

Panelists:

Gracie Arenas Strittmatter, *BioWare, Electronic Arts*

Jeff Vanelle, *BioWare, Electronic Arts*

Ben Cloward, *BioWare, Electronic Arts*

Eve Colvin, *BioWare, Electronic Arts*

Derrin Stewart, *BioWare, Electronic Arts*

'Space Explorers: Life in Orbit' – Filming VR In Microgravity
Wednesday, 31 July, 2:00 pm – 3:30 pm, West Hall B

In December 2018, *TIME* and Felix & Paul Studios launched virtual reality cameras — built to operate in microgravity — to the International Space Station. Since then, filming has documented astronauts from several countries in their daring missions more than 250 miles above Earth, capturing life in space as viewers have never truly seen before, and culminating in the first-ever spacewalk in cinematic virtual reality.

Join Felix & Paul Studios, along with collaborators from NASA and the ISS National Lab, as they share insights from one of the most ambitious VR projects ever undertaken. In this session, we will discuss the background of how this partnership came to be, before diving into the technical challenges of capturing cinematic virtual reality on the ISS: How do you direct a scene in such a tight and constrained place, especially from Earth? How can you transfer terabytes of data from the cameras to Mission Control? And finally, what does it take to build and operate cameras that can capture a spacewalk?

The team will explore the variety of challenges inherent in such a groundbreaking project, from building a camera that can capture an EVA (extra-vehicular activity) in the extreme environment of space, to tracking and crafting months of astronaut footage into a cohesive episodic narrative. The team will also share never-before-seen, early footage from the project.

Panelists:

Sebastian Sylwan, *Felix & Paul Studios*

Michael Interbartolo, *NASA*

Laura Gouillon, *Felix & Paul Studios*

The VFX of Netflix Series
Wednesday, 31 July, 3:45 pm – 5:15 pm, West Hall B

From the tragic tales of orphans to a joint force of super siblings to sinister forces threatening 1980s Indiana, the VFX teams on Netflix series have delivered some of the year's most astounding visuals. We've queued three of them up for bingeing en masse: Join creatives behind "A Series of Unfortunate Events," "The Umbrella Academy," and "Stranger Things" as they present some of the work, techniques, and passion that brought these worlds — and characters — into being.

Panelists:

Sean Santiago, *Netflix*

Chris White, *Weta Digital*

Aladino Debert, *Digital Domain*

Yvon Jardel, *Rodeo FX*

Paul Graff

Sue Rowe, *Sony Pictures Imageworks*

Everett Burrell

For the Throne – The Making of 'Game of Thrones': Season 8
Wednesday, 31 July, 6:30 pm – 8:00 pm, West Hall B

The eighth and final season of "Game of Thrones" was the most anticipated show in recent television history. The cinematic saga spanned six VFX-heavy episodes, from the spectacular Battle of Winterfell to the destruction of Red Keep, and its aftermath. In this talk, Weta Digital, Image Engine, Pixomondo, and Scanline team up to reveal the VFX they created for the climactic conclusion to "Game of Thrones," and how their collective work on the long-running series created a new standard of cinematic television that has forever changed the landscape of TV viewing.

The visual effects supervisor from each facility will delve in to the creation over 3,000 VFX shots across every episode, featuring dragons, large-scale environments, and epic battles. They will describe how they used cutting-edge film techniques to produce some of the most complex VFX ever seen on TV, and, in doing so, rewrote the rules of what can be accomplished on the small screen.

Panelists:

Martin Hill, *Weta Digital*

Thomas Schelesny, *Image Engine*

Zorianna Kit (moderator)

Ryo Sakaguchi, *Scanline VFX*

Sven Martin, *Pixomondo*

Production Sessions

'First Man': Redefining In-Camera FX
Thursday, 1 August, 10:45 am – 12:15 pm, West Hall B

As the lead VFX house, DNEG's work on "First Man" was centered around trying to achieve some of the most realistic and immersive in-camera VFX shots ever seen. The team used a blend of cutting-edge, in-camera VFX techniques, special effects, scale models, and never-be-fore-seen footage from NASA's archive to tell the story of Neil Armstrong's journey to the moon and back. Join VFX Producer Michelle Eisenreich and DNEG's Academy Award®-winning DFX Supervisor Tristan Myles as they share insights on how the "First Man" VFX crew were able to realize this by using one of the biggest LED screens ever built on a movie set.
Panelists:

Michelle Eisenreich, *DNEG*   Ian Hunter, *New Deal Studios*

'Alita: Battle Angel' – The Art of Being Human
Thursday, 1 August, 2:00 pm – 3:30 pm, West Hall B

"Alita: Battle Angel" follows the young cyborg Alita as she unearths her extraordinary past. Her palpable humanness was key to the film's success, and her character represents a new standard of photoreal digital doubles and humanoid CG character realization. Eric Saindon and Mike Cozens will discuss how advances in performance capture, CG biology, and facial animation bought her story to life.

Alita is a truly unique CG heroine that has the star power onscreen of a new actress in a breakthrough role. On-set, Rosa Salazar embodied a heartfelt and determined character, which Weta captured in unprecedented detail with their advanced performance capture system. Weta will touch on their development of performance capture technology since it was first conceived for "The Lord of the Rings," and how they have reached this latest milestone. The performance capture rig will be available for the audience to view after the presentation.

Weta interpolated Alita's facial puppet through a digital model of Rosa to achieve heightened muscle accuracy. Animators had new depths of detail to work with and were able to read and animate subtleties down to an inferred state of emotion. Her distinctive big brown eyes were modeled using fibers for her iris that emulate a real eye — each of which contained more geometry than all of Gollum in "The Lord of the Rings."

The task of creating Alita's world was manifold in its complexity. Iron City was designed as a light and colorful place, influenced by Latin America, with discordant layers of tex-tures and cultures to give it a dilapidated but energetic feel. Zalem hovers above like an unobtainable jewel. The live set was built on soundstages at Troublemaker Studios, and Weta completed the environment as a teeming world of reused technology populated by a mixed society of humans and cyborgs.
Panelist:

Nick Epstein, *Weta Digital*

Swing into Another Dimension:
The Making of 'Spider-Man: Into the Spider-Verse'
Thursday, 1 August, 3:45 pm – 5:15 pm, West Hall B

This session will explore the art and innovation behind the creation of the Academy Award®-winning "Spider-Man: Into the Spider-Verse." The filmmaking team behind the first-ever animated Spider-Man feature film took significant risks to develop an all-new visual style inspired by the graphic look of comic books. The hand of the artist is visible in every frame, including misalignments and bleeding colors, imperfections rarely seen in CG animation. The entire look of the film was driven by artists' intentions, in which design and style were more important than accuracy or realism.

The presentation will delve into the new technology developed and the changes to both the pipeline and workflow required to accommodate working in this new visual style. Every department at Sony Pictures Imageworks was asked to reconsider what it means to make an animated feature in the spirit of this revolutionary comic book style and to bring something new to the look of the film. Various new techniques were developed including the rigging and animating of facial line work, 2D hand-drawn effects, and stylized rendering.

Panelists:

Danny Dimian, *Sony Pictures Imageworks*

Joshua Beveridge, *Sony Pictures Imageworks*

Bret St. Clair, *Sony Pictures Imageworks*

Pav Grochola, *Sony Pictures Imageworks*

Ben Hendricks, *Sony Pictures Imageworks*

Get Up Close and Personal in the Production Gallery

This one-of-a-kind exhibit recognizes the art, processes, and physical materials involved in the creation of major studio projects — not just the final piece on screen. The gallery features artwork, props, and more from recent film, VR, or game productions for an exclusive behind-the-scenes look at some of Hollywood's biggest blockbusters.

Located in the Concourse Foyer, the Production Gallery will be open **Sunday, 28 July – Thursday, 1 August to all registration levels.**

Real-Time Live!

Causing Chaos: Physics and Destruction in Unreal Engine

Michael Lentine, Jim Van Allen, Matthias Worch, Richard Ugarte, Michael Balog
Epic Games, Inc.

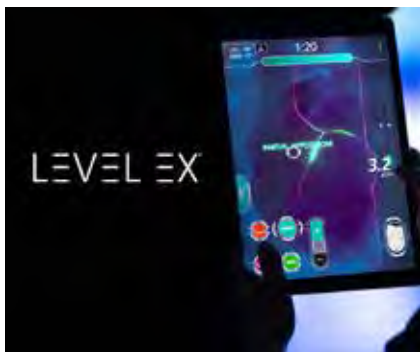## GauGAN: Semantic Image Synthesis With Spatially Adaptive Normalization

Taesung Park
University of California Berkeley
Ming-Yu Liu, Ting-Chun Wang, Chris Hebert, Gavriil Klimov
NVIDIA
Jun-Yan Zhu
MIT

Level Ex: Marching All Kinds of Rays… On Mobile

Sam Glassenberg, Matthew Yaeger, Andy Saia, Billy Basso
Level Ex, Inc.

Project Nira: Instant Interactive Real-Time Access to Multi-Gigabyte Sized 3D Assets on Any Device

Arash Keissami, Andrew Johnson, Dario Manesku

dRaster, Inc.; Nira.app

Quixel's Rebirth: Megascans Environment Breakdown

Galen Davis

Quixel

Real-Time Live!
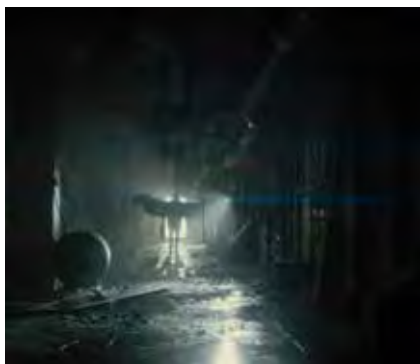
Real-Time Procedural VFX Characters in Unity's Real-Time Short Film "The Heretic"
Veselin Efremov, Adrian Lazar
Unity Technologies

Real-Time, Single Camera, Digital Human Development
Doug Roble, Darren Hendler, Jeremy Buttell, Lonnie Iannazzo, Melissa Cell, Deer Li, Jason Briggs, Chad Reddick, Mark Williams, Lucio Moser, Cydney Wong, Dimitry Kachkovski, Jason Huang, Kai Zhang, David McLean, Rickey Cloudsdale, Dan Milling, Ron Miller, JT Lawrence, Chinyu Chien
Digital Domain

"Reality vs Illusion" Real-Time Ray Tracing
Natalie Burke, Arisa Scott, Natalya Tatarchuk, Sebastien Lagarde
Unity Technologies

Spooky Action at a Distance: Real-Time VR Interaction for Non Real-Time Remote Robotics

Pavel Savkin, Nathan Quinn, Lochlainn Wilson

SE4 Inc.

VR Hair Salon for Avatars

Koki Nagano, Hao Li, Liwen Hu

Pinscreen
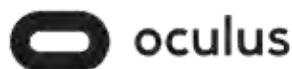
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