About the Film

Who will build the amazing future of our human race? That question sparks a giant-screen adventure unlike any other in DREAM BIG: Engineering Our World, an epically fun tour of inspiration through the visionary advances made by yesterday’s, today’s – and most thrillingly of all, tomorrow’s – engineers. Throughout human history, engineers have been behind-the-scenes forging an ingenious variety of lifesaving, even civilization-altering, structures, gadgets and gizmos. Yet never before have engineers been so vital to humanity and so visible in the culture as they are now, as young women and men literally shoot for the stars and bust through old barriers to create a world only they can imagine.

Narrated by Academy Award® winner Jeff Bridges, this is the story told by DREAM BIG, marking the first film for IMAX® and giant-screen theatres to answer the call of the STEM (Science, Technology, Engineering, Math) initiative – which offers a fresh perspective on engineering and aims to inspire kids of diverse backgrounds to become the innovators, educators and leaders who will improve the lives of people across our entire planet throughout the 21st Century.

Whatever you think engineering is, you’ll probably think again as the award-winning filmmaking team at MacGillivray Freeman Films reveals not only the grandeur but the heart, humanity and optimism that exists within every problem-solving project. For no matter how complex any engineering venture is, the bedrock of every single one starts with the hopes and dreams of real people.

Produced in partnership with the American Society of Civil Engineers and presented by Bechtel Corporation, DREAM BIG reveals how engineers have changed both everyday lives and entire societies: from the Roman Arch to the Great Wall of China, from one much-needed village bridge to the cosmic International Space Station, from underwater robots to death-defying rollercoasters, wind-defying skyscrapers and pneumatic tube vehicles that might one day zoom at 700 MPH. The journey spans the globe because engineering is truly a universally shared need – from China and Nepal to Dubai, Australia and Haiti back to Seattle, San Francisco and Phoenix, Arizona, following a group of engineers from diverse backgrounds, each excited to ask in their own way: “What cool solutions can we come up with next?”

The film’s eclectic, stereotype-busting engineer cast includes: Menzer Pehlivan, a Turkish-American who grew up wanting to be a movie star until a huge earthquake revealed another way to make a major impact on the world (engineering buildings that keep people safe); Steve Burrows, a curiosity-driven British structural engineer who is a kind of time traveler, using cutting-edge technology to uncover the ancient past in China and construct the future in San Francisco; Avery Bang, who builds bridges in underdeveloped countries, connecting people with new opportunities; and Angelica Hernandez, a Mexican immigrant turned leading Arizona engineer who got her start in the legendary robotics club at Carl Hayden High School in Phoenix, AZ.

DREAM BIG rises to a stirring, emotional climax as the underdog team at Carl Hayden tries to beat the odds in a NASA-sponsored competition head-on against MIT, Harvard and other elite schools – pitting their $800, lovingly-built underwater robot named Stinky against far more elaborate machines, with only the sheer power of their ideas to give them a shot. It’s the perfect encapsulation of what engineering is all about: ordinary people finding ways to defy the impossible and change the world, and their own lives, in the process.
Introduction To The Production: Not Just a Movie, But a Movement

“Scientists study the world as it is. Engineers create the world that has never been.”
~ Theodore von Karman, Aerospace Engineer

Engineering: upon first consideration, it might not seem the stuff of grand cinematic adventure. But could engineering secretly be an exciting, creative, heroic realm where the optimists of today are creating the life-saving, world-altering marvels that will make for a safer, more connected, more equal and even more awe-inspiring tomorrow?

The filmmakers at MacGillivray Freeman Films (MFF), in partnership with the American Society of Civil Engineers and Bechtel Corporation, answer that question in a resoundingly positive way in what is fittingly their biggest production to date: DREAM BIG, a film that is not only a journey through engineering’s greatest wonders but equally a tale of human grit, aspiration, compassion and the triumph of human ingenuity over life’s greatest challenges. The project is so big, that the MFF team sees it as more than a movie – it’s also intended to be part of a movement aimed at bringing engineering into the forefront of American culture. That’s why the film will be accompanied across the U.S. by ongoing educational, museum and community efforts to expose young people from all backgrounds and walks of life to what engineering is … and what it can conjure in the world.

Narrated by Academy Award winner Jeff Bridges, DREAM BIG took MFF’s filmmakers on a 3-year odyssey and to a greater number of locations than any previous film they’ve tackled. From the outset, the close-knit team of filmmaking veterans faced their biggest storytelling challenge: how to bust the long-standing myth that films about science and engineering can’t be mesmerizing, relatable or full of heart. They were determined to completely do away with that illusion, while also upending stereotypes about just who it is who becomes an engineer and why their careers mean so much to them. Engineering can be a mystery to those who have never encountered it up close, so MFF embraced that approach – using a series of surprising human stories to expose the hidden world behind the most exciting inventions and structures in our daily lives.

With more than 2.4 million STEM jobs estimated to need filling by 2018, the film’s message couldn’t be any more timely or relevant to families. And with African-Americans and Latinos now representing just 9% of the science and engineering workforce, the room for exponential growth is clear.

Says director Greg MacGillivray of why MFF was inspired to devote themselves to this massive undertaking: “For the past two decades, people have been itching for a popular film about STEM. Teachers, museums and parents are looking for ways to get kids not just exposed to but also really turned on by science and engineering. So we wanted to see if we could bring something new to that effort with an entertaining, visually spectacular film full of stirring human stories, one that energizes kids of all kinds, including girls and minorities, to think about engineering as something that might be an exciting thing to do with their lives and their way to make a mark on the world.”

The film is a bit of a departure for MacGillivray, best known for his deeply immersive and visually innovative explorations of the world’s most spectacular and often remote creatures and landscapes. But Greg and his team still approached DREAM BIG in their typically adventuresome style – deciding to travel the globe in search of some of engineering’s most captivating feats and stories.

In each locale, the filmmakers use the scope of 3-D IMAX to give an unprecedented view inside the engineering marvels they uncover in their path. Breathtaking imagery takes you soaring into the twists of China’s 127-story Shanghai Tower; circling through the wildly inventive Falkirk Wheel, the world’s only rotating boatlift; rolling through the desert on sun-power in Australia’s World Solar Challenge Race; sizzling amid the mirrors of the Mojave Desert’s Ivanpah solar power plant; rocketing through North Las Vegas with
the Hyperloop transportation experiment; and down to the wire at the Underwater Robot Competition at the University of California in Santa Barbara.

Producer Shaun MacGillivray says: “This film actually has more worldwide locations than any film we’ve shot before. There was a ton of logistics involved, but it was all worthwhile because we really wanted to emphasize the global nature of engineering, which is vital anywhere and everywhere you go on earth. But we also wanted to balance these big, visually awesome projects that take your breath away with projects that are equally about the power of compassion, such as Avery Bang’s Bridges to Prosperity, which helps poor communities by literally building bridges to new worlds.”

Shaun continues: “We embraced the idea of incredible breadth in DREAM BIG – because it showcases how engineering can be so cool in so many different ways. We also hope the film reveals that engineering has at its core far more than just math and science, as people tend to think. Sure, you need to study math and science to become an engineer. But engineering is just as much about getting creative, about helping people and even carving out our human destiny. That’s exciting stuff for anyone.”

For production manager Meghan MacGillivray, the approach of the film was different from any other in the company’s long and varied history of filmmaking. “It’s the biggest topic we’ve attempted,” she muses. “So we had to find a way to tell a massive story in just 45 minutes, one that not only does justice to the amazing engineers we met but that really gets kids thinking, ‘this is super fun.’ For us, the heart of it all was finding our cast, who each in their own way make the subject joyful and thrilling. At the same time, the imagery of the film – from the ancient Great Wall of China to San Francisco’s futuristic Transbay building – is just made for the majesty of IMAX. It’s a true marriage of visual and personal storytelling, which is what we love the most.”

That the cast includes so many women was also exhilarating for Meghan. “I just love having these amazing, powerful, strong women on the IMAX screen,” she confesses.

The vastness of the production is matched by MFF’s epic efforts to make DREAM BIG not just a movie but a movement that might have ripple effects beyond the theatre. From the start, the team hooked up with key forces within the engineering world – including the American Society of Civil Engineers (ASCE), the oldest national engineering society in the United States, and Bechtel Corporation, the largest civil engineering firm in the United States, which was founded in 1898 to help construct the nation’s railroads and then later ventured into roads, bridges, and highways throughout the western United States. In fact, in the summer of 1931, Bechtel joined with other contractors in the construction of the Hoover Dam. Now, 118 years after its founding, Bechtel has completed more than 25,000 projects worldwide. In addition to supporting the film production, Bechtel has been actively involved in other aspects of the film by serving as a technical content advisor and supporting the development of the program’s educational content.

ASCE has been working for a long time to connect the American public with engineering and especially to diversify engineering – to attract more women and minorities to a profession that thrives on different points of view and experiences. The ASCE previously worked with renowned public television station WGBH in Boston on a Peabody Award-winning project about the building of marvels like skyscrapers, bridges and domes. But DREAM BIG offered an unprecedented opportunity to take engineering to family audiences who might never even have given it a thought before, let alone known it could spark a wild adventure.

“This film is another major step towards telling the story of engineering on a larger and larger scale,” says ASCE Executive Director Tom Smith. “MacGillivray Freeman Films and the IMAX format are a perfect match for this story because giant structures are that much more spectacular on the giant screen. But as visually exciting as this film is, we are especially gratified by the personal experiences it shares –experiences that reveal how vitally important engineers are to our society right now and to future generations. We’re excited for audiences to see how engineers are working in such unique ways to make our world a better, safer, more wondrous place.”
Smith continues: “The challenges engineers are taking on are the big ones: clean water, smart buildings, climate change, creating sustainable cities for tomorrow. And that means there is a pressing need for lots of young people to bring their fresh ideas. We hope many will be inspired when they see how engineering can take you to different places across the globe, from China to Nepal to Seattle. You also see how different kinds of people – from Avery Bang working in Haiti to a first-generation American such as Angelica Hernandez making her dreams come true in Phoenix to Steve Burrows flying across China – can each make their own individual mark on their communities and the world at large.”

Bechtel saw it has a natural fit getting involved with a film that highlights the exciting lives of engineers. "DREAM BIG is a first of its kind film that aims to educate the public about the inspiring work that engineers are doing worldwide,” said Charlene Wheeless, principal vice president at Bechtel for Global Corporate Affairs. “The production also gives us a fresh way to reach out to all kids, especially girls—a group that we know from countless research studies is less likely to pursue science, technology, engineering and mathematics careers. Our aim is for the film to inspire more girls to pursue career opportunities in engineering.”

Wheeless adds: “Every day, engineers bring creativity, discipline and passion to their work. The film showcases how engineers dream big to create a sustainable future and better quality of life for people everywhere. Whether its mega-construction projects, technology innovations, solar cars, or humanitarian structures, engineers across many disciplines, backgrounds and industries can and do change the world.”

STEM education has been a long-time focus for Bechtel. In 1990 Stephen D. Bechtel Jr. served as the first chair of DiscoverE (formerly National Engineers Week Foundation), and also supports diverse STEM organizations like Society of Women Engineers, National Action Council for Minorities in Engineering and National Society of Black Engineers.

With the support of ASCE, Bechtel and additional partners, MFF will, on top of the film’s release, bring forth an unparalleled array of exhibits, events and educational programs to accompany DREAM BIG and take the film from visceral viewing experience to fully interactive educational movement. They include:

- An expertly designed school program that includes 12 lesson plans for grades K-12
- 50 hands-on engineering activities designed specifically for museums and informal outreach
- Plans for engineering-themed events including Girls’ Nights Out
- Collaborations with local ASCE groups across the country, as well as other groups including the Society of Women Engineers and the Society of Hispanic Professional Engineers
- Local engineers leading demos and events at museums, schools and public places

The hope is that the mix of DREAM BIG and these enhanced programs will light fires of aspiration, even in unexpected places.

“To us, the film is a kick-off to a campaign that aims to give everyone, children and adults, hands-on engineering experiences,” Greg MacGillivray describes. “We created the film to be as entertaining and fun for everyone as we could -- but we do harbor a wish that it might spark a kid to think ‘hey, I’d like to design a futuristic building or life-changing bridge or cool underwater robot one day.’ If there’s a 10 year-old girl in the audience thinking ‘I have ideas, too,’ we want to not only inspire her but give her a chance to learn more and keep going.”

Adds Shaun: “The educational outreach makes DREAM BIG ten times more exciting. All of this entertaining, cool, accessible content enhances the movie experience and can lead to more discovery.”
ASCE’s Tom Smith says: “It was important to all of us involved in DREAM BIG that it not just be a good movie, but that it also be woven into the efforts so many of us in the community have been making to engage a wide range of people with hands-on engineering. By adding terrific resources for teachers, students and the public, the reach can continue beyond the theatre.”

Remarkably, though DREAM BIG is perhaps MFF’s most tech-oriented film ever – traversing such otherworldly realms as cloud-bursting high-rises, futuristic machines and even outer space – Greg sees it as among his most moving works.

He sums up: “When we first began exploring this film, we had many questions about how we could possibly tell this story with the excitement and span it deserved. But the people we met along the way were so incredible, they inspired us to think in new ways. When we saw Menzer Pehlivan forging earthquake-proof designs or Avery Bang working hand-in-hand with Haitian communities or Angelica Hernandez making the journey from immigrant to leading voice among female engineers or Steve Burrows using lasers to map a one-of-a-kind manmade wonder – they are what motivated us. They are everyday heroes, and their stories are what turned the film into our most emotional and heartfelt journey.”

**DREAM BIG’s Vision of Engineering:**

**It’s the Engine That Will Drive Our Future**

It’s easy to overlook but the word engineering, which can sound so hard and no-nonsense, actually has its roots in the magical, mystical Latin word ingenium, which refers to the natural, never-ending human thirst for invention…and is also the root of the celebratory word ingenious.

Indeed as a species we humans seem to have an incessant, positive drive to invent and create, and we always have. In a sense, the very first engineers were the very first hominids crafting the very first human tools. As humanity developed, it was early engineers – the bold tinkerers and idea molders – who discovered the wheel, the pulley and the lever, the basic building blocks of civilization. Egyptian engineers erected the mysterious pyramids; Ancient Greek engineers invented gear systems and the first sophisticated machines; while Ancient Roman engineers unleashed the architectural power of the arch.

By the 19th Century, engineering expanded to include newfangled electrical and chemical engineering, sparking the world-altering Industrial Revolution. More recently came aeronautics engineering, which ignited the Space Age as humans dared to engineer for travel beyond our planet, and more recently the marvels of the tech industry – which have turned some engineers into celebrities.

But that might all pale compared to the ideas that are right now just over the horizon – and a new generation of inspired, exuberant, creative engineers is needed like never before. The demand couldn’t be any higher for curious, creative minds to follow a whole slew of vital engineering ideas – ideas about how to design and provide energy for our rapidly growing cities (2 billion more people are expected to live in cities by 2035); how to create sustainable, interconnected communities that work for everyone; how to build safe, efficient living and working spaces and transportation networks; how to speed up recovery from natural disasters; how to invent life-enhancing, culture-shifting devices utilizing breakthroughs in nanotechnology, biotechnology and high-powered computing; and how we can explore the magnificence of the surrounding universe, to name just a few in a multiplicity of engineering fields that are making profound headway.

It’s enough to inspire a call to young people everywhere, says Greg MacGillivray. “The last time there was a big boom in kids getting interested in science and engineering was during the Space Race,” notes Greg, referring to the era when President John F. Kennedy put out a call for Americans to devote themselves to the mission to fly to the moon. “Since then, there’s been a brain drain into other fields, whether finance or law or the arts – all of which are interesting and necessary, but without engineers we would not progress as a society, so that story needs to be told. Without engineers, we wouldn’t have any of the cool gadgets we love or be able
to solve the big but winnable challenges that stand before us. Really, without engineers, the future could not be as amazing as we dream it can be.”

Still, that begs the question, how do you get people excited about engineering in a movie? For the MFF team, the lengthy process of bringing DREAM BIG to the screen started with a lot of research – and a close look at intriguing data already compiled by the American Society of Civil Engineers and other organizations on exactly what gets kids from a variety of backgrounds super motivated to start playing with engineering concepts. “We came into this ready to learn about how we could best inspire our audience,” Greg explains. “Many people have been studying these questions – and we took away some key lessons, including that what kids most want is to create, to be role models and to make a difference in our world. Each one of those is emphasized in the stories we chose for the film.”

Adds editor and creative producer Stephen Judson: “We could have created just a visual parade of magnificent engineering achievements – and we do showcase a lot of those. But we perceived early on that the key to reaching a wide range of audiences – and especially engaging kids who might not have ever seen how creative engineering is – was to find just the right characters. In all our films, we try to give people a sense of going somewhere they might not ever go on their own. That same quality is in DREAM BIG, but if you’re young, we hope you also get a sense that this could be your future.”

The American Society for Civil Engineering, one of MFF’s major partners in DREAM BIG, has long been focused on reaching out to communities that don’t traditionally pursue or even get exposed to engineering – especially women and minorities—guided by research suggesting that part of the problem is simply perception. The traditional focus in schools had been on the academic side of engineering so it is perceived as being for a limited group of people already on a path of acquiring math and science skills. Yet there is one key thing no one is talking about: the amazing, creative things engineers accomplish.

That, it turns out, is the secret that has started to expand engineering’s appeal among a much broader group of young people. In the last year, enrollment in engineering programs has increased overall and significantly among women. The trends are exciting but there remains much to be done, and there is bound to be far more progress as new programs kick into gear. More outreach, more role models, and more spotlighting of engineering in the culture – with movies and movements such as DREAM BIG – are on the horizon.

Says Tom Smith, Executive Director of ASCE: “We’ve looked at the deeper motivators that drive young people to choose careers – and we know kids today want the chance to be part of something that impacts society; they enjoy working in teams with smart, fun, engaged people; they want to be able to have flexibility and open-mindedness in their jobs. All of that is encompassed in engineering. That’s why we think these stories in DREAM BIG are going to be so compelling. Yet inspirational as these stories are, they are just a small slice of the big picture. For every Menzer, Avery and Angelica you see in the film, there are just as many fascinating engineers in every community in America – and we hope kids will get a chance through the film’s educational programs to meet some of them.”

For the MFF team, the lessons learned about just how to engage kids in engineering merged with their own deep understanding of how to tell the most compelling visual stories. They knew that audiences would be spellbound when IMAX cameras captured some of the grandest engineering projects ever built. But then they started searching for a cast of “star” engineers who are each breaking the mold including women, immigrants and people from low-income backgrounds.

“We considered in the course of this movie so many fascinating projects – a big part of the process was just narrowing it down to the very best of the best. We did more initial research for DREAM BIG than for any project we’ve ever done. We had so many ideas in the end we could have done 10 more movies, but the painful part was letting some of them go,” says Steve Judson.
Sums up Meghan MacGillivray: “DREAM BIG has some of the most dramatic footage we’ve yet captured, but the real drama is in our cast. Menzer, Avery, Steve and Angelica invited us into their personal worlds. They lift the curtain on what it’s really like to be an engineer in today’s world – what drives them, what they love about what they do, what makes them so excited to get up every day and take on such incredible challenges – and the picture they paint is hard to resist.”

**Stopping A Quake’s Dangerous Shake: Earthquake-Proof Engineering With Menzer Pehlivan**

On August 17th, 1999, the ground beneath Turkey’s capital city of Ankara began to rumble. After 37 seconds of powerful, dizzying shaking, a magnitude 7.6 earthquake centered in Izmit left portions of Izmit, Ankara and surrounding areas in devastating ruins. 17,000 people lost their lives that day, half a million were left without homes and the economic damage reached as high as 8 billion dollars.

In the midst of it all, 13 year-old Menzer Pehlivan – a future engineer though she did not know it yet – was forced to evacuate her apartment building. It was a scary experience, but she was most stirred by her thoughts of those who were less fortunate, whose loved ones and houses were so suddenly taken away. How could such a tragedy be prevented from ever harming people again? And could one young girl be a part of that process? “That was the seed,” says Menzer in 2016, “that planted in my head early on that I would become a civil engineer focusing on seismic safety. It had a big impact on my future.”

Menzer was already a good student, but she faced obstacles to pursuing an engineering career in Turkey, where, as in much of the world, engineering has traditionally been perceived of as a male-dominated pursuit. Yet girls such as Menzer are quickly and completely changing the narrative of who can become an engineer all around the world – as well as showing just what is possible when people from different backgrounds bring their own lives, experiences and dreams to engineering careers.

“When she was in school, Menzer’s teacher told her females can’t become engineers. Can you imagine that?” asks Greg MacGillivray. “But it was her grandfather who told her: you can do anything that you put your mind to in life, Menzer – keep going and never give up because of what others say. He gave her that strength and now she is an expert earthquake engineer.”

For Menzer, defying stereotypes is part of who she remains as a person. The daughter of a dress designer, she loves fashion and style almost as much as engineering and does things her own way. “I’m never happy with the ordinary,” she laughs. She recalls meeting one young student while filming DREAM BIG who could not believe her appearance. “This little girl was looking at my heels and hair and she asked, ‘Are you sure you’re an engineer? You’re not just an actress playing an engineer?’ She said, ‘I didn’t know engineers could look like you.’ I think this is something too many people misunderstand. You can be an engineer and wear heels and dresses and be a ‘girly girl.’ Or you can be the opposite. Anyone can be an engineer.”

That same quality of a woman writing her own story on her own terms instantly drew MacGillivray Freeman to Menzer as a lead character for DREAM BIG. “Menzer is such a vivacious personality – that shone through the minute we met her,” recalls Meghan MacGillivray. “She’s prominent in the life-saving field of earthquake safety, which is already intriguing, but she’s also got her own charisma and style. She’s beautiful and fun, yet she really walks the walk as a leader in her field.”

Menzer notes that, although engineering has been a challenging career path for women in the past, engineering is also highly revered in her native Turkey. “In Turkey, it is similar to becoming a doctor or lawyer,” she explains. “Turkey is a developing country so construction projects have a great importance to the society and it’s a very prestigious thing to be part of the building of the country. It is still a man’s world to some degree, but it is changing and there are women doing incredible things.”
The prestige of engineering also means the best schools are highly competitive. Once she got past that discouraging teacher, Menzer had to take an intense entry exam involving 180 questions in 180 minutes just to qualify; but she nailed it and never looked back. After getting her undergraduate degree, she then decided to make the long journey to Austin, Texas to go after a Ph.D. in one of the world’s best earthquake engineering programs. “Having seen what happens when buildings fail in an earthquake, that became my drive,” Menzer explains. “When we understand all of what causes buildings and infrastructure to fail, we can prevent a lot of unnecessary death and heartache from earthquakes.”

That’s exactly what Menzer does now, as well as working on other civil engineering and infrastructure projects for CH2M, a large engineering firm in Seattle that provides consulting, design and construction services for corporations and governments across the blog.

*DREAM BIG* captures Menzer’s new life in bustling Seattle. But the film also catches her in the field performing extraordinary volunteer work, as the MFF team dramatically captures how Menzer and a multinational earthquake reconnaissance team went all the way to the steep mountainsides of Nepal, after a massive 7.8 earthquake buried fragile villages under rubble. It was heart wrenching for Menzer to see the quake’s effects on the people of Nepal, especially knowing first-hand what it is like for children to live amid such destruction, but the trip was equally filled with signs of triumphant resilience. Menzer had a chance to see up close the determined, unbowed spirit of the local people— and also a chance to collect critical data that will help engineers design future structures that can better withstand these huge natural forces.

“Every earthquake presents a vital chance for us to learn all kinds of new things,” Menzer points out. “There are many earthquake models but the very best way to measure how buildings actually respond in an earthquake is to gather the data right after they happen and before reconstruction begins. It’s a narrow window of opportunity for earthquake engineers to gain a much deeper understanding. A big part of what we do is to take the lessons from the past to design for the future. And while advanced seismic systems are still very expensive, there is a lot of work being done on more inexpensive designs that can optimize the performance of a building much better than older construction.”

For Menzer, the big impact of earthquake engineering on real lives is a prime example of what might draw a kid in 2016 to aim high as an engineer. “As an engineer, you actually get to use your mind to change the world — and you can actually see it change,” Menzer enthuses. “You can build a skyscraper that changes the skyline of a big city or a treatment plant that helps keep that city’s water clean. You can have whatever life you want to have as an engineer, so long as you are willing to work hard. You can build stuff, you can help people, and you can even save lives as an engineer. If you engineer a building that is still standing after an earthquake, you have just saved hundreds of lives. I think not enough people really know this side of engineering. There is so much personal satisfaction from improving people’s lives.”

As for working with the MFF team, Menzer was as awed by them as they were by her achievements. “After a short time, they really started to feel more like members of my family,” she muses. “It was an incredible experience making this film, especially for me, because I grew up wanting to be an actress, and it isn’t so often that an engineer gets to make a movie. This was my one chance to combine both dreams. More than that, it’s so exciting to have the chance to show people how important engineering is to the world — and I don’t think many forms can do that better than a movie.”

**It Takes A Village:**

**Building Community Bridges In Haiti With Avery Bang**

The journey of *DREAM BIG* makes a rousing stop on one of the most stunningly beautiful island nations in the world, the Caribbean country of Haiti. It is here that a local community and the international organization Bridges to Prosperity have come together to put an immediate, fate-changing halt to a deadly situation – lives needlessly lost each year as men, women and children attempt to cross a fast-moving river just
to get to their jobs, schools, doctors or other villages. Here, the raising of a new footbridge means more than most people can imagine, leading both to safety and fresh opportunities.

While those of us leading urban lives often take the bridges and roads that twine through our cities for granted, an estimated 1 billion people around the world live without access to any kind of transportation network at all. Even seemingly simple structures such as basic footbridges can have major ripple effects through these communities – lowering mortality, not only because people no longer have to brave ripping river currents but because people can suddenly reach medical clinics they couldn’t before, as well as raising education levels because kids can more easily get to schools.

In Haiti, MFF met up with Avery Bang, the go-getter, thirty-something CEO of Bridges To Prosperity, another remarkable young woman who upends the usual picture of what an engineer looks like and reveals a whole new side of who an engineer might be – someone not only smart and practical, but daring and idealistic. Bang loves to travel, loves to watch communities gaining new skills, loves making a difference. She loves simple solutions, but she also has big, big plans – including creating a single turn-key system for bridge building that will allow communities across the entire globe to put up footbridges with limited resources.

“As soon as we met Avery, we all fell in love with her spirit,” says Greg MacGillivray. “She’s just a terrific young woman and when my wife Barbara and I went to scout in Haiti, we were very moved by what she and her team are accomplishing with the bridges they build. She works arm-in-arm with the town’s people, so it’s a fully local effort. We had the chance to watch as this village built a strong, modern footbridge almost entirely out of recycled or donated materials for just $100,000. It’s a beautiful thing to see that just one modest structure in the right place can change so many lives.”

Bang’s story also reveals that in today’s world, engineering can appeal as much to adventurers and the socially committed as number crunchers. “For Avery, it’s not about making a huge salary, which clearly she could do with her skills. Instead, she gets to live a life full of travel and adventure, while going to sleep at night knowing she’s doing her part to give something to humanity,” muses Greg.

It’s a path Bang found almost by accident. The daughter of a civil engineer in Iowa, she feels she was fortunate to get a sense at a very young age of engineering’s impact on the world around us. “I remember as a kid, we would visit public work projects as part of our family holidays,” Avery laughs. “It definitely gave me a different view of engineering from the start. Because of my dad, I think I saw early on that there can be a real heroic element to engineering.”

Still, Avery didn’t know for sure what she wanted to do with her life. She was more of a jock than an academic in high school and the instinct to give back only hit her when she started studying abroad on another lush island: Fiji. “That was when I had my big Eureka moment,” she recalls. “I had just lost a close family member to breast cancer and felt I had some soul-searching to do. When I got to Fiji, I volunteered to do some work with cancer patients there, and that’s when I started to realize the profound connection that exists between health and the ability to access care – and saw that access is a problem that engineering can solve.”

She continues: “One of the communities had recently opened a footbridge development project, and I was able to see firsthand how a simple bridge was transforming their everyday world. People could get to the doctor, to schools and to markets they could never have reached before. I directly experienced how structures change people’s lives. That’s when I really started taking engineering seriously. When I came back from Fiji, it became both a passion and a purpose for me.”

Back in the U.S., Avery began volunteering with Bridges to Prosperity (B2P), a young non-profit organization now working in 14 countries to aid local engineers and communities build safe, efficient bridges across sometimes treacherous rivers. She founded B2P’s university program while still an undergraduate student at the University of Iowa. While writing her master’s thesis on building sustainable bridges at the
University of Colorado, Avery quickly rose to a prominent role in the organization and was soon named President and CEO.

In that capacity, she welcomed the call from MacGillivray Freeman Films, and asked them to come to Haiti to witness the organization in action. She wanted the story to be as much about the strength of the people building the bridge in Haiti as about her own engineering career. While Haiti is often depicted in the media as a realm of struggle and disaster, Avery had come to know a place of pride and possibilities.

“To their incredible credit, Greg and Barbara got on a plane and came to Haiti – and I think they saw immediately that there was not only an amazing visual angle to this story but that it is also a story of hope and of positive things that are happening on Haiti,” Avery says. “They are such visionaries that they saw this as a story of a community coming together to build something that benefits all. That idea was really exciting.”

Later, when the entire crew arrived, Avery was even more impressed. “I really respect the whole filmmaking team and the way they devoted so much time and resources to really being with us in Haiti. It’s not an easy place to film but they embraced the way things work there and it was amazing to watch them doing what they do best: getting the most amazing shots.”

Haiti is still recovering slowly from the 7.0 earthquake that rocked the island nation in 2010, and the MFF team saw reminders of the devastation and frustrations with the recovery process all around them, but director of photography Brad Ohlund notes that people in the village were warm and welcoming to the crew. “The real joy of what we do is when you have that personal interaction with real people in local communities,” says the cinematographer. “We had such a great time getting to know the people building the bridge.”

Ohlund continues: “The Haitians might not have much in the way of material things but they have such tremendous spirit. We really experienced that and we wanted to capture it. We got there at the perfect time in the construction of the bridge, which had only just begun. They had just put in the footings and were about to raise the supports on the bridge, so we got to shoot much of it as it happened. And then we got to see the impact. Before the bridge was finished, we watched little kids taking off their school uniforms to cross the river and then re-dressing once they made it to the other side, but after they didn’t have to worry anymore.”

Recently, the MFF team learned the village where they shot took a direct hit from devastating Hurricane Matthew. Amid this worrying news, they were heartened to learn that while wind and water damage in the area was considerable, the footbridge survived and is being rehabilitated for a re-opening later this spring.

Natural disasters are part of what engineers have to anticipate in their designs – building for every contingency of the future. But Avery is aware that isn’t always easy to do in countries where resources are at a premium. That’s why she has made Bridges To Prosperity’s next mission a big one: to create a single, standardized, affordable bridge-building template that incorporates modern safety features but can become a reality anywhere. Bridges to Prosperity is working with a devoted group of leading engineering companies and thinkers around the globe to come up with a template that can be easily adjusted to fit local conditions and includes basic training for local people so that more homegrown engineers can maintain these critical structures, even with slim budgets.

“The idea is to have a standardized template that can then be easily adapted to local needs. So if you were to go to Rwanda or Bolivia the bridges might look a bit different than in Haiti, but they would all be following the same standard principles that will make construction faster, stronger and more cost effective,” Avery explains.

She goes on: “One thing you don’t see in the film is that we have incredible teams of experts who are working with us. This organization is not only a bunch of young American kids. It’s a global movement that is becoming integrated into the entire engineering industry,” Avery explains. “We’re attempting to build a global
army of engineers ready to take on this work. We’ve already just had the milestone of our one-millionth customer served, and our staff is jazzed to keep expanding on that.”

Of course, building bridges is not the only way engineers can and do give back. Avery notes that the opportunities are mind-boggling right now. “There are so many way for engineers to be part of the solutions we need everywhere,” she muses. “In the big picture, we’re looking at a population of 10 billion people on earth by 2050, half of that number living in densely populated cities. That means we’re going to have to double the infrastructure we currently have – but at the same time we’re going to have to tackle the global water crisis and climate change and going carbon neutral. We’re going to need lots of smart, creative engineers designing new systems and also we need engineers to sit at the table for policy making. Engineers have the training to identify problems and find solutions, and the world is calling for that right now. It’s a career with endless potential.”

Asked what she hopes young audiences might take away from the experience of DREAM BIG, Avery considers the question carefully. “I think kids have such a profound sense of curiosity and I feel if this movie sparks kids to be just a little more curious about engineering that will be an amazing thing. I hope it’s a chance to see that engineering can be as impactful as being a doctor or a teacher or a musician. It’s a field that can be truly exciting, that can be really helpful to others, and that can be fulfilling for anyone who wants to go out into the world and create a better future. I’m hopeful a film like this can get that idea into kids’ heads – and who better to do that than MacGillivray Freeman?”

High And Wide: From The Great Wall Of China and the Shanghai Tower To The Future Of San Francisco With Steve Burrows

Steve Burrows – a leading engineering visionary currently serving as Executive Vice President and USA Director of Buildings for San Francisco’s WSP engineering consultancy – might appear at first glance to be the most typical of DREAM BIG’s wide-ranging cast of characters. But his background and sweeping curiosity about engineering’s potential to illuminate both the ancient past and the approaching future make him utterly unique. For Burrows, engineering is a chance to be part of answering every question humanity has about both where we’ve been and where we are headed as society progresses through this century of accelerating change.

As he puts it: “An engineer is a solution looking for the most exciting problems.”

Burrows notes that growing up in England, he never could have imagined his current life. “My father was a smart guy but he left school at age 14. He had a job operating an excavator, digging trenches and putting drains in. But one thing I do remember is that he always talked reverently about the civil engineer coming onto the site. He saw the engineer as a very important person and that stuck with me.”

Uninspired and unsure of his future, for a time Burrows himself dropped out of school. It was only when a friend of his started studying engineering, that Burrows became motivated – largely to prove he was just as capable as his mate. “It was sheer competitiveness that got me interested in the beginning,” Burrows admits. “I didn’t have any grand plan.”

Then, a teacher changed everything. “Sometimes you come across an educator who sees your potential and who removes the obstacles to your seeing them,” he explains. “That’s what happened to me. One teacher told me I had an innate ability and he helped me see all the amazing things I could do with it. Since then, I’ve never stopped being amazed and I’ve never stopped looking around the corner for the next thing. And the opportunities have been limitless.”

Burrows can toss off engineer jokes with the best of them – but he notes that the stereotypes are patently false. “The jokes are legendary and of course, people do say engineers are boring, but I can’t remember ever once being bored in my job,” he muses. “Imagine having the chance to design a stadium where
the Olympic Games take place. [Burrows worked on the famed “Bird’s Nest” Stadium for the Beijing Olympics.] Who gets the chance to do something like that? Only engineers. When you see a news story about say, driverless cars coming soon, it is an engineer who thinks: how are we going to design city infrastructures and spaces for this? We turn the wildest concepts into realities.”

Indeed, Burrows thinks the big secret of engineering is that it is a far more thrilling profession than the culture has yet let on. “My experience is that the engineers I’ve known are some of the weirdest, wackiest, most interesting people I’ve met, coming from all walks of life – and the one thing we share is this inner desire to shape the world. There aren’t very many chances in most people’s lives to leave a legacy that lasts 100 years or more. Yet, as engineers, we get that rare chance all the time. To me, that makes most other job seems much more boring. I get such a buzz from creating something lasting. Really, I think we’re the luckiest people on earth.”

While Burrows is currently focused on several pioneering projects in San Francisco, he has also been lured by the past, drawn to exploring some of the most unique and mysterious engineering feats of ancient times. That’s why he was so excited to take MFF on a trek over the peaks and hills of China’s Northern provinces, tracing the Great Wall of China. “It’s a wonderful fit for the story of this film because it really is one of the greatest and most immense engineering projects in all of history and it’s also the kind of grand landscape that can be so breathtaking in IMAX,” he says.

What’s known today as The Great Wall of China is actually several structures and fortifications that combined stretch more than a staggering 13,000 miles. It is also a structure that has an entire timeline of its own. That timeline begins in the 3rd Century BC, when the first Emperor of China, Emperor Qin, envisioned joining existing walls and building new structures as a means of preventing incursions of nomads into the Chinese Empire. Enormous manpower and logistics went into forging the first portions of the structure – provided by armies, peasants and prisoners.

But The Great Wall as it is seen today in China is a rebuilt and enhanced version of that wall – an undertaking of China’s last feudal regime, The Ming Dynasty, which reigned from 1368 to 1644. During those two centuries, a massive engineering project the likes of which the world hasn’t seen since turned the wall into its modern form, incorporating bridges, temples, watch towers and pagodas, built entirely of stone, bricks and earth.

Burrows had an original idea for exploring the wall’s secrets, one that blends technology and history. He wanted to use one of modern engineering’s most intriguing surveying tools – the 3D laser-scanning LIDAR (which stands for Light Detection and Ranging) drone that takes precise measurements by bouncing targeted laser lights off of objects – to produce unprecedented images of the wall. Burrows believes LIDAR will be a major boon for historical preservation projects around the world.

“Laser scanning enables us to capture the great ancient monuments of the world in new ways – and even to re-create them in precise detail should they decay or be destroyed,” explains Burrows. “It’s a tremendous opportunity to both learn about the past and to maintain the world’s cultural heritage.”

The MFF team was both mystified and mesmerized by the Great Wall. “It’s somewhat misnamed. It’s really not so much a Great Wall as it is an Unbelievably Awesome Wall,” laughs Brad Ohlund. “You really don’t have any idea just how steep it would be or how physically challenging it is just to follow the wall until you are there. The view into history is just awesome, but it was especially amazing to be there with Steve. He’s a great font of knowledge and if you had a question about the wall, no matter how obscure, he’d have the answer.”

Exploring the Great Wall with LIDAR led Burrows to surprising revelations – including that the strength of the wall is partly due to the use of a Chinese staple, sticky rice, as an ingenious form of mortar
throughout the structure. “You see how the engineers of those times had their limitations, yet they found very clever ways around them, solving problem just as we do today,” Burrows says.

He goes on: “Another thing that blew my mind is the knife’s edge that much of the wall was built upon – it was truly an amazing feat of engineering. I think most people imagine The Great Wall is built on flat ground, but it actually crosses rivers and valleys and a lot of different, challenging terrain. It was fascinating to see how the engineers of those times dealt with that. And then you find all these signaling towers along the wall – and that’s when you realize it’s so much more than a wall. It’s a massive infrastructure that was created to channel communication flows and water flows in a way that is very modern.”

Ultimately, Burrows believes that LIDAR can do something almost supernatural: give the past a contemporary voice. “The deeper you look at how it was made, the more the wall starts telling its story and that’s how you really start to understand history,” he says.

Still, it presented major challenges for the filmmakers. Hauling IMAX cameras along the wall was daunting. Mao Zedong once said, “He who has not climbed The Great Wall is not a man,” but add several hundred pounds of camera equipment and that climb turns into a whole new category of challenge. “At times it took a super-human effort,” admits Ohlund, “but our Chinese crews and the Hunan Film and TV Group, which coordinated the local production, were terrific and tireless.” There were occasional snafus – including the time the production unwittingly launched a drone into a Chinese military area, drawing the government’s concern but Ohlund notes that a quick phone call cleared up what could have become an international incident.

The Great Wall of China started a national fascination with enormous infrastructure projects – one that is continuing in China today with a massive building boom from apartment buildings to colossal public works projects. With an urban population that has soared by more than 131 million people since 2000, China has been rapidly upping construction. “They’re building there like we did in the U.S. in the 1950s,” observes Ohlund. “They’re building bridges the size of the Golden Gate Bridge but they’re building them everywhere across the country.”

To capture some of China’s forward-looking engineering in action, the MFF team used special time-lapse camera systems to photograph one of those bridges – the Longjiang Bridge – over the fascinating course of its construction.

They also took a head-spinning excursion to the tallest skyscraper in China – and the world’s 2nd tallest building: the Shanghai Tower, opened in 2015, which features 127 stories that rise above the clouds in spiral form that is at once romantic and practical, shedding huge wind forces while resembling a dragon’s serpentine tail. Designed by the American architectural firm Gensler and created in conjunction with a consortium of Chinese companies and the New York-based structural engineering firm, Thornton Tomasetti, it is also a certified LEED Platinum building due to its inventive sustainability features. These include the world’s tallest wind turbines, which take advantage of the powerful air currents surrounding the tower to provide 10% of the building’s energy, and a state-of-the-art rainwater collection system.

DREAM BIG takes an up-close look at Shanghai Tower’s stunning glass façade, which twists in a triangle through 120 degrees as it soars, an elegant means of battling one of the biggest problems all super-tall buildings face: their vulnerability to fierce gusts that can stress the structure and cause upper floors to take on a dizzying sway. To prevent this, the tower’s rotational design was tested in wind tunnels that simulate the region’s typhoon-strength winds. The precision engineering of the building’s twist was found to reduce the impact of wind forces by 24%, which in turn resulted in major costs savings.

Filming in the middle of the world’s most populous city– not to mention getting on top of such a massive mega-structure – was no easy feat for MFF, but it was irresistible. “It was extremely hard to get permission to shoot at the Shanghai Tower,” notes Ohlund, “but it is such a stunning and innovative piece of engineering that we persisted. We used drone shots to get that birds-eye view of its amazing shape and design.”
Back in San Francisco, Burrows enticed MFF with another exciting technology that is profoundly changing engineering: virtual reality walk-throughs of construction projects. “A lot of engineering is about communicating,” notes Burrows. “So now that we have this technology, we use virtual reality as a means of communication, to show our clients what a building is going to look like in a 3D model that gives them a much deeper view. When you have clients virtually walking through a building, they’re so much more engaged and they ask questions that might not otherwise have come up until later.”

He also took the crew on a journey into an exciting project in the works: the new, dramatically designed Transbay Transit Center, scheduled to open in 2017 to provide a modern, technology-driven transit hub in the heart of San Francisco, a kind of contemporary “Grand Central Station West.” The massive structure that will house the hub includes a 5-acre park built on top of the structure and integrates energy efficiency features and information technology into the building’s functions.

“It’s an extraordinary structure to explore with IMAX and I think people will be really awed by the scale of it, says Burrows. “It’s absolutely a modern wonder of the world that is being constructed right before our eyes. It’s also an ‘intelligent building’ – a building that integrates advanced technology to create a safer, more comfortable and productive environment – and that I think is going to be the wave of the future.”

Ohlund also went next door to the under-construction Salesforce Tower, which will be the 2nd tallest building west of the Mississippi River at 61 stories and 1,071 feet when it opens in 2018. There he hung the IMAX camera out a high window to capture a slightly vertiginous but one-of-a-kind view. “It’s one of those dramatic IMAX shots that gets audiences talking, although you have to be careful not to make people too dizzy,” he muses. “We like to include some of those, but it’s also a great way to show the scale and ambition of modern engineering projects in big cities.”

“We had an amazing shoot in and around Transbay,” says Meghan MacGillivray. “It’s such a massive project, it was a little overwhelming. But luckily, we had Steve Burrows to give us an inside view into how all these many different pieces are coming together into one of the most high-tech buildings in the United States. This structure is just made for the IMAX camera!”

Meghan also loves how Burrows contrasts with the other engineer stars of DREAM BIG. “I love that you see how different kinds of people find different paths in engineering. You can get down and dirty like Avery, or you can be sophisticated like Menzer or you can be determined to bust out of limitations like Angelica or you can be a visionary who is as fascinated by history as he is by the future like Steve,” she points out.

Burrows especially enjoyed watching the MFF team coming up with their own original ideas for getting unusual shots, whether in China or on the Transbay site. “I’m always attracted to working with people who are really great at what they do and who show how much they love it – and that is the case with Greg, Brad and the whole team at MacGillivray Freeman. I also very much enjoyed their open-minded approach to making this film. They all share a child-like love of discovery and they brought that to our world of engineering in a way that can hopefully show it in a new light that surprises audiences,” says Burrows.

Asked to weigh in on the future of engineering, Burrows is, naturally, chock full of ideas. He mentions a few leading ways engineering is changing: “One thing changing fast is that our industry is tackling its own inefficiency. Soon, we’re going to see buildings that are built more like airplanes, ships and cars. We’re going to see more modular and prefab structures made in pieces, then assembled on-site. Buildings will be put up twice as fast with half as much waste,” he says.

Burrows continues: “Another big area of change right now is robotics and soon we’re going to see more machines involved in everyday projects. New materials are also coming – materials that will allow buildings to not only be more responsive to people, but also more sustainable and healthier. We’re also going
to see more clever integrations of buildings and data – where a building might tell us where it’s experiencing stress or starting to crumble long before it becomes a problem. Buildings are going to have brains, in a sense, and that will be a big leap forward.”

The decades to come are going to be full of fast-paced change and that is one thing Burrows hopes audiences take away from their experience with DREAM BIG. He sums up: “I’d like the film to create some real excitement toward engineering, to inspire kids especially, maybe even to become engineers. I don’t believe anyone will ever regret the decision to become an engineer. It can take you around the world and you can be part of fixing the world’s most pressing and fascinating challenges.”

**Of Robots And Underdogs:**

**Angelica Hernandez On The Legacy Of Carl Hayden High**

One of the most remarkable stories the MFF team came across as they set out in search of intriguing engineers to guide audiences into the world of DREAM BIG was also one of the most unlikely: that of the ragtag but ultimately world-famous Falcon Robotics Team from Carl Hayden High School in Phoenix. This small, underfunded, seemingly overmatched team set its sights on one of the most prestigious engineering competitions in the country: the underwater robot competition known as the Remote Operated Vehicle competition, which would pit their young and inexperienced robot designers against college students from MIT, Harvard and other elite universities.

Says Greg MacGillivray “For me, this story was the ultimate find for DREAM BIG. It’s a heartfelt story that echoes David vs. Goliath – where you have these very resourceful children from impoverished backgrounds and a then-unknown school taking on some of the richest and most sophisticated schools in the country, with surprising results. The Falcon Robotics Team had very little money and no reputation -- but what they did have was a great mentor in teacher Fredi Lajvardi who really cared about them and their education. And what they also had was ingenuity and a willingness to persevere against the odds. They never gave up and that is always the most inspirational of human qualities.”

Adds Stephen Judson: “The story of the underwater robot competition and of Angelica Hernandez became the anchor of the film. In fact, it’s hard to conceive of this film without this part of the story, because this is where we really found the heart of engineering.”

The story unfolded in 2004. Carl Hayden was then known largely as a school where as many as 80% of the kids were living below the poverty line. Many were Hispanic immigrants, some undocumented and living in the shadows. But teachers Fredi Lajvardi and Allan Cameron were determined to find some way to make learning fun for kids who, outside of school, were living under so much pressure. That’s why they decided to kick off a robotics club. It was a chance for kids of little means to rely on their imaginations in big, unlimited ways. It’s also why they decided to enter the Marine Advanced Technology Remotely Operated Vehicle competition, which requires students to design an underwater robot capable of carrying out sophisticated assigned missions. The robot that best completes the missions wins.

They didn’t take their chances very seriously – but they did think it was worth the kids trying with all their might. Together, the team engineered a remote-control robot with just $800 worth of parts, mainly PVC pipes equipped with a processor, propellers, depth detectors, an underwater microphone and a very sensitive pincer. They named it Stinky, in honor of the reeking stench of the rubber glue they used to hold it together.

The competition was almost over for Carl Hayden before it began when their robot sprung a leak. But the rest became history – covered widely in the media and even sparking a Hollywood feature film – when they jiggered an ingenious, last-second solution and the chance for their robot to complete obstacles even the most prestigious teams had failed.
Today the robotics program is world-famous and thriving – it has grown ten-fold in numbers of participants since 2004 and about half of the participants are now women. Many of its students go on to college. One young woman who got her start at Carl Hayden in the famed robotics club is Angelica Hernandez, whose own story – which leads from Mexico to Stanford – is one of rousing tenacity and triumph. Angelica was on the robotics team at Carl Hayden when Stinky made its competitive debut, though she was unable to go to the competition due to ROTC duties, and it kicked off her engineering career.

Says Shaun MacGillivray. “One of the things you get from the story of Carl Hayden is that anyone can beat the odds – and part of that is teamwork. When you’re working in a team, there’s so much passion to help one another succeed and that’s a life-long lesson. I love that in DREAM BIG you see Angelica learning this as a young kid and then applying it in her own job years later.”

As a high school student Angelica already had a lot to grapple with as an undocumented immigrant who came to the U.S. from Zacatecas, Mexico at 9 years old with her single mother. Though living in tough circumstances and with the constant fear of sudden deportation, Angelica found her unexpected calling when the robotics club gave her a taste of engineering. Despite having almost no role models to follow, Angelica set out to become a role model for others. She graduated as the school’s valedictorian, then studied mechanical engineering at Arizona State. After being approved as a recipient of the Dream Act in 2012, in 2014, Angelica graduated from Stanford University at the top of her class with a Master’s of Science in Atmosphere and Energy and is now just starting an exciting career focused on clean energy.

“Angelica’s story is really the American story and in a sense, it could only have happened here;” muses Greg MacGillivray. “She came from a background where a lot of the time kids aren’t expected or even encouraged to go to college – in part because there’s such a big need for kids to get jobs and help the family out as soon as they finish high school. But Fredi told Angelica, you have to go to college, and she buckled down and made it happen. She became a shining example of the possibilities for anyone in this country to succeed if you work hard and dedicate yourself.”

Like many kids, Angelica had almost no clue of what an engineer does when she joined the robotics club at Carl Hayden. It wasn’t even on her mind. “First I joined ROTC and that’s when I started hearing more about the robotics team,” she remembers. “But really, I had no idea what they even did or what it was all about. When I finally joined, it turned out to be so much bigger and more exciting than what I thought it was.”

It took time for her fascination to fully spark, but when it did, it never stopped. “At first, I was very shy and kind of kept to myself,” she confesses. “But then I discovered the competitions and the mentoring, both of which I found that I loved. It’s one thing to be working on a robot in a schoolroom but the competitions took me into a world I’d never had any exposure to – it was a place where I was meeting real inventors and scientists and everyone was so excited about all the different designs. I learned about working in teams and the fun of experimentation and I realized, this is what I want to do with my life.”

It wasn’t the easiest path for Angelica, but it was one she took on with consistent grit and determination. Thanks to the DACA (Deferred Action for Childhood Arrivals), also known as the Dream Act, she was able to pursue her education. “I went through a lot of challenges,” she says, “but I also had a lot of support. I hope that I can give other kids the hope that even if you don’t come from a family with a lot of resources or if you’re undocumented, you still can achieve a lot. If you have something clear in mind that you want to achieve, and you stick to it, and you’re persistent, you will get there.”

Today, Angelica acknowledges she is an example for others who might not be thinking engineering is in the cards for them. “It’s very moving to me that young girls look up to me as a success story,” she says. “I think it’s so important for young people to realize there are a lot of people out here who want to help them, too. You might not be able to find support in your family but there are a lot of great mentors and teachers in the world. If you’re open-minded and willing to explore that can take you very far.”
Angelica currently works on energy efficiency programs for Nexant, Inc, an Arizona-based company focused on clean energy solutions. It’s exhilarating work. “I think the most exciting part of being an engineer is that every day, you’re helping to change the world,” she says. “You might be working to solve our energy challenges, or maybe you’re saving someone’s life with biomedical engineering, or maybe you’re working in developing countries, or you’re making safer buildings. No matter what you focus on, as an engineer you feel like you are part of creating our world’s future.”

Looking back, Angelica notes that one obstacle that stands between kids in places similar to where she grew up and engineering careers are mistaken stereotypes of what an engineer should look and be like. Those are the clichés she hopes DREAM BIG unravels. “Engineering is so much more than most kids believe it to be, so we have to help more kids grasp how many different kinds of people are doing engineering -- and we need to get out the message that everything we do in life has some engineering to it. There’s not just one type of person who can become an engineer, there’s not just one kind of engineering job and there are no pre-defined requirements. Anybody who wants to can do it,” she offers.

Giving back remains an important part of Angelica’s life – and today, she’s gratified to serve as a mentor as well as a judge at competitions similar to the one that thrust Carl Hayden High into the limelight. “It’s wonderful,” she says of being a judge. “I am constantly awed by just how creative kids can be when they are allowed to explore without any limits. These kids are the future – so I find it a great thing to interact with them and to have the chance to see how they see the world.”

To tell the story of Carl Hayden’s illustrious past, the MFF team had to rely on re-creation, including hiring actors to play the original four-man team that traveled with Stinky to the competition. “It was quite a process re-creating the robotics team from 2004,” notes Greg. “Fortunately, Angelica has such a youthful quality that she was able to play herself as a younger woman. But for the others, we went through a pretty extensive casting process to get authentic actors. We did also sneak in a shot of two of the real team members, who you can spot sitting in the audience at the awards banquet.”

“It was one of our biggest challenges in the editing room to create this flashback sequence that is also a core of the film’s storytelling,” notes Stephen Judson. “But we found a way to show organically how Angelica’s success story had its beginnings with this ingenious group of kids who didn’t give up.”

For Angelica, returning to Carl Hayden was both emotional and encouraging. “It was a great experience to go back into those memories, but also to see how different it is now,” she says. They have ten times more resources than we did a decade ago, and there are so many more girls not just involved but doing electrical work and the actual building. It was really neat to see that. It was also moving for me to have this chance to work with Fredi again. He made such a huge difference in my life.”

Greg MacGillivray says getting to know the kids at Carl Hayden high was a life-altering experience. It struck him that here he saw what engineering is all about: the art of making things possible. “I’ve made a lot of films in astonishing places all around the world, but getting to know these kids has been one of the most interesting and inspiring experiences I’ve ever had,” he concludes.

**Engineering Innovation Meets Visual Invention:**
**Shooting DREAM BIG**

Director Greg MacGillivray and MacGillivray Freeman Films have taken IMAX® cameras to some of the most inaccessible places on earth – from the deepest depths of the wild blue ocean to the celestial heights of Mt. Everest. The cameras, themselves masterworks of electrical engineering, have forged their own visual
language that drops moviegoers directly into the moment in a way ordinary, two-dimensional cinema never can. But this project presented some big questions for MFF right off the bat.

Brad Ohlund, *DREAM BIG*’s director of photography, sums them up: “Could we take such a complex, mathematical subject and convert it into the kinds of heart-pounding images and moving stories IMAX audiences love to see? Of course, buildings, bridges, tunnels and futuristic trains all have visual grandeur, but they also take a long time to build, so we had to figure out how to shoot them in the most exciting ways at the most intriguing moments. We used everything from time-lapse photography to drones, and as it turned out, we were able to really make the subject come to life.”

Drones are a big new force in engineering surveying – and also in filmmaking – and were essential to giving a bird’s-eye view on engineering projects throughout *DREAM BIG*. Says Greg MacGillivray: “We used a lot of drone photography, especially in China and San Francisco. The drone is becoming such a useful tool for us because it can go safely into areas where flying a helicopter might be too dangerous. Also, a drone’s versatility allows the audience to see something like a skyscraper or the vista of a bridge from fresh angles that can give them a new experience of things.”

Aerial photography master Ron Goodman, known for the design of his geo-stabilized SpaceCam which has become the standard for aerial photography in motion pictures, was also key to many of the film’s most stirring shots. “Ron always brings us the most incredible aerial images which no matter how daring are always absolutely rock-steady and smooth. There is no better way of getting an awe-inspiring view of the outside of a beautiful skyscraper or intricate bridge than these aerial shots,” says Greg.

Times are changing even in the world of IMAX and while Greg and Brad acknowledge that Old School celluloid is rapidly being replaced by digital tools, they still use about a 60-40 ratio of film to digital – largely because IMAX cameras running on traditional film can’t yet be beat for stunning resolution. At the same time, they are moving forward. “As the digital revolution continues, we’re edging further and further into more digital tools,” says Greg. “It’s a learning process for us to apply it to what we do, but right now it means taking twice as many cameras into a production! However, an IMAX camera is still the only way to get those wide shots that give you that you-are-there feeling.”

“For this film we used a lot of the giant Solido 3D IMAX camera,” Greg continues, referring to the double-lensed workhorse that weighs over 300 pounds when fully loaded with film. “I believe it’s still the highest-quality IMAX camera ever built and the clarity is simply unmatched.”

The editing process for *DREAM BIG* also held its own problem-solving challenges for the MFF team. Long-time MFF editor Stephen Judson joined with Mark Fletcher and Jason “JP” Paul in the editing room for a unique experience. “This film involves some very complex ideas and stories so the huge challenge was to get to the essence of things simply, efficiently but in ways that really resonate,” says Judson. “It was a very delicate balance because we wanted to create a kaleidoscopic overview of the creativity of engineering – but at the same time, narrow in on sequences that are full of feeling and substance. That’s not easy to do in giant screen filmmaking. Greg has such an incredible eye for getting the images that work on the giant screen so we had a lot to work with – but it was about finding the right rhythms and balance. Of course we love to do things that are departures because we learn so much.”

In addition to the main stories of Menzer, Avery, Steve and Angelica, the MFF team faced many photographic challenges unique to the vast, global scale of *DREAM BIG*. One was heading to the other side of the planet, going Down Under to shoot a Mississippi high school team competing in Australia’s famed World Solar Challenge Race, a 1,900-mile trek from Darwin to Adelaide, showcasing the world’s most efficient vehicles powered by the sun. Inaugurated in 1987, the race hopes to drive advances in renewable energy and automotive technology while putting on an intriguing show.
Still, this is not your grandfather’s car race. “The cars typically only go about 30 miles per hour,” notes Ohlund, “so we were wondering before we got there if we could find enough suspense and adrenaline excitement. As it turns out the suspense is in the cars actually getting to the checkpoints every day. While we were shooting, cars went off the course, broke down and the thrill was in watching them limp across the checkpoints with just minutes to spare. It was full of drama.”

Another inspiring shoot for the MFF camera team took place in a patch of desert in North Las Vegas, seemingly the middle of no place. But it is here that forward-looking engineers are working on a revolutionary supersonic train dubbed the Hyperloop – which could one day zoom from LA to San Francisco in a mind-blowing 30 minutes. First pioneered by entrepreneur Elon Musk of SpaceX and Tesla, this potential engineering marvel hopes to work similarly to a massive vacuum tube system, propelling pod-like cars with powerful magnets through tunnels at 700 MPH. Though still in the earliest testing stages, the MFF team couldn’t resist the chance to capture a potentially world-changing engineering concept in the throes of development.

Right now, the Hyperloop test center is working with sleds on small portions of electromagnetic track. Ohlund immediately sensed the best way to show off what the Hyperloop is all about: “The only way to do the concept justice was to mount an IMAX camera directly upon the sled,” he says. “Right now, the sled only goes up to 120 MPH but when you put an IMAX camera on top of it, the images get really interesting. One of the big challenges is that the sled has no brakes at this point – they just use a bunch of sand to slow it down. IMAX cameras don’t like sand so we put the camera in an underwater housing. We also couldn’t be on the track during the test runs, so we had to remotely start the cameras.”

It was all worth it to get a taste of what the Hyperloop might become, says Ohlund. “The Hyperloop gives you a sense of where engineering is going – and what our world might soon look like.”

Though the MFF team is renowned for shooting the world’s rawest, most untouched landscapes, Ohlund had equal fun shooting man-made wonders. Still, like Greg MacGillivray, he says the human stories are what gave a direct hit to his heart – and is what puts the dreams into DREAM BIG. “We put a lot into capturing huge engineering projects in different stages,” Brad says. “But that can’t compete with the people we met. Whether it’s Haitians building a bridge for their own community or Menzer helping after the Nepal earthquake or Angelica going from immigrant to engineer -- that’s the stuff you take with you.”

There is a very strong hope that DREAM BIG will be an experience that audiences will take with them long after the projector stops – an experience that continues to spark curiosity, questions, awe and maybe even aspiration. That’s why it is so important to MFF that this is truly not just a movie, but an educational movement that offers chances to spur even more learning.

“We love to create entertaining, informative, visually transporting movies,” sums up Greg. “And this one we think is bigger and more moving than any we have created yet. But we also harbor a hope that this film can act, along with so many other efforts on behalf of STEM, as a bit of a catalyst. We hope to one day meet a young woman who maybe says to us, ‘I saw DREAM BIG, and that’s where my own dreams started.’ That’s an exciting idea to us personally, because the more engineers we have from different backgrounds, following different paths and ideas, the brighter our future looks.”
ABOUT THE NARRATOR

JEFF BRIDGES

One of Hollywood’s most successful actors and a six-time Academy Award® nominee, JEFF BRIDGES’ performance in “Crazy Heart”—as Bad Blake, the down-on-his-luck, alcoholic country music singer at the center of the drama—deservedly garnered the iconic performer his first Oscar® for Best Performance by an Actor in a Leading Role. The performance also earned him the Golden Globe, SAG Award and the IFP/Spirit Award for Lead Actor. Bridges’ moving and multi-layered performance is one of many in a career that spans decades.

He earned his first Oscar® nod in 1971 for Best Supporting Actor in Peter Bogdanovich’s “The Last Picture Show,” co-starring Cybill Shepherd. Three years later, he received his second Best Supporting Actor nomination for his role in Michael Cimino’s “Thunderbolt and Lightfoot.” By 1984 he landed top kudos with a Best Actor nomination for “Starman”; that performance also earned him a Golden Globe nomination. In 2001, he was honored with another Golden Globe nomination and his fourth Oscar® nomination for his role in “The Contender,” Rod Lurie’s political thriller, co-starring Gary Oldman and Joan Allen, in which Bridges played the President of the United States.

In December 2010 his reunion with the Coen Brothers in the critically acclaimed western “True Grit” landed him his sixth Oscar® nomination. The same month he was seen in the highly anticipated 3D action-adventure “TRON: Legacy.” Bridges reprised his role of video-game developer Kevin Flynn from the classic 1982 film “TRON.” With state-of-the-art technology, “TRON: Legacy” featured Bridges as the first actor in cinematic history to play opposite a younger version of himself.

He was last seen in “Hell or High Water” a modern action bank heist thriller set in west Texas starring opposite Chris Pine, Ben Foster and Gil Birmingham. The film that premiered Un Certain Regard at the 2016 Cannes Film festival was written by Taylor Sheridan and directed by David Mackenzie.

The actor’s multi-faceted career has cut a wide swathe across all genres. He has starred in numerous box office hits, including Gary Ross’ “Seabiscuit,” Terry Gilliam’s offbeat comedic drama “The Fisher King” (co-starring Robin Williams), the multi-award-nominated “The Fabulous Baker Boys” (co-starring his brother Beau Bridges and Michelle Pfeiffer), “The Jagged Edge” (opposite Glenn Close), Francis Ford Coppola’s “Tucker: The Man and His Dream,” “Blown Away” (co-starring his late father Lloyd Bridges and Tommy Lee Jones), Peter Weir’s “Fearless” (with Isabella Rossellini and Rosie Perez), and Martin Bell’s “American Heart” (with Edward Furlong, produced by Bridges’ company, AsIs Productions). That film earned Bridges an IFP/Spirit Award in 1993 for Best Actor.

In 1983, Jeff founded the End Hunger Network, a non-profit organization dedicated to feeding children around the world. He is currently the national spokesman for the Share Our Strength/No Kid Hungry campaign that is fighting to end childhood hunger in America.

In August 2011 Jeff released his self-titled major label debut album for Blue Note Records. Multiple-Grammy Award-winning songwriter, musician and producer T Bone Burnett produced the album. It is an organic extension and culmination of his personal, professional and music friendship with Burnett, whom he has known for more than 30 years.

Jeff and his wife Susan divide their time between their home in Santa Barbara, California, and their ranch in Montana.
ABOUT THE CAST

AVERY BANG

Avery Louise Bang is President and CEO of Bridges to Prosperity (B2P), a nonprofit social enterprise providing isolated communities with access to essential health care, education and economic opportunities by building footbridges over impassable rivers. Reaching nearly one million people around the world, B2P has partnered with national and regional governments to develop their rural transportation networks and connect their most isolated citizens to the resources they need the most. B2P has received considerable recognition for its work, including being named of the Top 10 Social Enterprises in the world by Classy.org, and was named the 2016 Ashden International Sustainable Solutions award recipient.

Avery received her Master’s Degree in Geotechnical Engineering from the University of Colorado at Boulder. There, her graduate research was conducted with National Engineering Academy member Bernard Amadei, which considered designs for rural, low-tech applications looking at designs for rural low-tech applications. At the University of Colorado, Avery founded the B2P University Program and became its executive director.

Avery has spoken at conferences around the world. She has garnered an Honorary Doctorate of Science from Clarkson University and Distinguished Alumni awards from both the University of Iowa and the University of Colorado. She has also been recognized as an Engineering News Record (ENR) Top 25 Newsmaker, and a Top 20 Under 40 by ENR Mountain Region and was named to the American Society of Civil Engineers (ASCE) list of Top 10 New Faces in Civil Engineering in 2011. Avery is currently attending an MBA program at Oxford University in the UK.

STEVE BURROWS

Steve Burrows serves as Executive Vice President and the USA Director of Buildings for the engineer firm WSP – a job to which he brings over 30 years of experience in engineering buildings around the world. He has worked on projects of all types, including stadia, mixed-use and commercial buildings, retail and leisure developments, hotels and airports. Additionally, Steve has experience in forensic engineering and structural assessment of damaged buildings, and made assessments after bombings in Manchester in 1996 and in Kenya in1998.

Currently based in San Francisco, Steve has led the engineering of many significant projects, including Apple’s planned headquarters in Cupertino, CA; the Beijing Olympic Stadium (the Birdsnest); Stanford University’s Graduate School of Business; and the City of Manchester Stadium in the U.K., built for the Commonwealth Games.

Steve received his BSc Honours in Civil Engineering from Liverpool Polytechnic. He is a chartered engineer in the U.K., a professional engineer in California, and a LEED AP. In addition, he is a fellow of the Institution of Civil Engineers, a member of the Institution of Structural Engineers, and a Fellow of the American Society of Civil Engineers. Among the honors he has received are the Brunel Medal in 2004 and the distinguished Commander of the Order of the British Empire in 2009.

Steve also presents engineering shows on the Science and National Geographic TV channels to promote engineering.
ANGELICA HERNANDEZ

Angelica Hernandez is currently an engineer working on energy efficiency projects with Arizona’s Nexant, Inc., a firm that provides clean energy solutions for utilities, governments and companies worldwide. She immigrated to the United States at nine years of age with her mother and sister, growing up in Phoenix. Despite the challenges of being undocumented and from a lower-income family, Hernandez joined the soon-to-be award-winning robotics club at Carl Hayden High School, where she became a star student and competitor in robotics competitions. She went on to graduate as a distinguished student of the mechanical engineering class of 2011 from Arizona State University, and later graduated with a Master of Science in Atmosphere and Energy from Stanford University in 2014.

Angelica has been recognized with numerous awards, including the City of Phoenix’s Outstanding Young Woman of the Year and Arizona State University’s Distinguished Graduating Engineering Student. Angelica continues to work as a mentor to students, as a judge for robotics competitions and as an advocate for the Dream Act.

FREDI LAJVARDI

Faridodin “Fredi” Lajvardi is the program manager for the Marine Science Magnet Program at Carl Hayden High School in Phoenix, Arizona. He has not only been teaching at Carl Hayden for 28 years, but also leading the Falcon Robotics Team, the extracurricular STEM program that has received national and worldwide recognition. In 2004, the team had its break-out moment when students dared to enter the MATE National ROV Championships in Santa Barbara, California – where they beat MIT and other major universities, returning as national champions of an advanced robotics competition that some said they had no business entering.

The Carl Hayden team has since gone on to win or place highly in many other robotics competitions. In addition to DREAM BIG, the team has been featured in the critically acclaimed documentary Underwater Dreams and the Hollywood drama Spare Parts. Their story of unimagined success through high-spirited dedication has inspired many other robotics teams and young students around the nation.

Meanwhile, Falcon Robotics has revolutionized STEM education at Carl Hayden High School and dramatically increased the number of students who choose to enter engineering and technical fields. Lajvardi continues to advocate for all schools to have an extracurricular STEM program. By showing the youth of today that STEM fields can be fun, exciting and rewarding, Lajvardi believes these programs can help to reverse the science, math and technology deficit that exists across the United States.

Lajvardi has received numerous awards for his innovative teaching, including the IEEE National Outstanding Educator for 2005, the Arizona Department of Education Leadership Award for 2006, and the City of Phoenix Outstanding Teacher of the Year each year from 2005 through 2009.

MENZER PEHLIVAN

Dr. Menzer Pehlivan was recently named to the ASCE’s 2016 list of New Faces in Civil Engineering.

Menzer grew up in Ankara, Turkey where in 1990, at age 13, she experienced the devastating 7.6 earthquake that sparked her desire to help prevent future tragedies on that scale. Right away, and despite being told women don’t become engineers, she began preparing for a career focused on earthquake
engineering. She received her Ph.D. degree from the University of Texas at Austin in 2013 with a doctoral thesis on the vital subject of assessing seismic hazards in nuclear facilities.

Menzer currently works in the Seattle office of CH2M, a global engineering company that provides consulting, design, construction services for corporations and government. After joining CH2M, Menzer was appointed Chair of the new “Engagement and Outreach Committee” of the ASCE Geo-Institute.

As a geotechnical engineer, Menzer has worked on numerous geotechnical and earthquake projects in the U.S., Canada and Mexico. She has given back as a volunteer in major earthquake reconnaissance efforts, including after the 2015 Nepal Earthquake, where she traveled with the Geotechnical Extreme Events Reconnaissance Association (GEER).
ABOUT THE FILMMAKERS

GREG MACGILLIVRAY (Director) is a giant-screen documentary filmmaker who has produced and directed many of the most successful films shown in IMAX theatres, including the box-office hit Everest and the Academy Award-nominated films The Living Sea and Dolphins. His 2016 film, National Parks Adventure, received the Best Film of the Year award from the Giant Screen Cinema Association, and was the highest grossing documentary of 2016.

With 38 giant-screen films to his credit, MacGillivray has shot more 70mm film than anyone in cinema history—more than two million feet. He is the first documentary filmmaker to reach the $1 billion benchmark in worldwide ticket sales. An ardent ocean conservationist, MacGillivray and his wife Barbara founded the One World One Ocean Foundation, a non-profit public charity devoted to ocean science education through giant-screen films and companion programming.

SHAUN MACGILLIVRAY (Producer) is President of MacGillivray Freeman Films and Managing Director of the company’s One World One Ocean Campaign, a multi-year, multi-platform ocean media initiative aimed at inspiring greater public awareness about the world’s oceans.

Producer of the award-winning 3D giant-screen films National Parks Adventure, Humpback Whales, Journey To The South Pacific, To The Arctic and Grand Canyon Adventure, MacGillivray is also producing the company’s forthcoming films America’s Treasures and Return To Everest. The son of Academy Award-nominated filmmaker Greg MacGillivray, Shaun grew up on film locations all around the world.

STEPHEN JUDSON (Editor/Creative Producer) has directed five films for IMAX theatres, including most recently The Alps and Journey into Amazing Caves. He served as a producer, director, writer and editor on the giant-screen blockbuster Everest. Since 1982, Judson has edited all but two of MacGillivray Freeman’s giant-screen films, making him the most experienced editor in the giant-screen field. He has written or co-written many MFF films, including the Oscar®-nominated Dolphins. He also serves as the company’s Vice President for Production and Post Production.

Before joining the MacGillivray Freeman team, Judson worked as a writer/director/editor in Hollywood, including long stints at ABC and Universal Studios. A graduate of Yale University with an M.A. from the USC cinema school, Judson is a member of the Writer's Guild of America, and the Academy of Motion Picture Arts and Sciences.

JASON “JP” PAUL (Editor) joined MacGillivray Freeman in 2011 as the in-house sound supervisor and digital editor for the award-winning One World One Ocean campaign. Since then, he has worked on many projects, from sizzle reels to behind-the-scenes webisodes and trailers. He served as editor most recently on National Parks Adventure. He also designed the audio and visual components of the interactive, traveling museum exhibit, “Sea Monsters Revealed.”

Jason is passionate about telling stories through the immersive medium of IMAX cinematography, and credits his years of working directly alongside Greg MacGillivray and Steve Judson with his ability to use the unique IMAX format to create a powerful and emotionally engaging story.

MARK FLETCHER (Editor) has been a wildlife film editor and writer for over 25 years, and has worked with leading wildlife filmmakers including Hugo van Lawick, Howard Hall, and Alan Root. Films that he has produced, edited or written have won over 50 Emmys, and many other awards.

**BRAD OHLUND** (Director of Photography) has worked in the giant-screen industry for 25 years. His projects with MacGillivray Freeman Films include the giant-screen films *Dolphins, Adventures in Wild California, Journey Into Amazing Caves, Coral Reef Adventure, Mystery of the Nile, Greece: Secrets of the Past, Hurricane on the Bayou, Grand Canyon Adventure, Arabia, To The Arctic, Journey To The South Pacific, Humpback Whales* and *National Parks Adventure*.

After attending Brooks Institute of Photography in Santa Barbara, California, Ohlund began his career with the classic film *To Fly!* Since then, his broad and varied assignments have included filming underwater reefs in the South Pacific and primitive tribes in New Guinea and Borneo. He has filmed from a plane through the eye of a hurricane and captured the fury of an approaching tornado with an IMAX camera.

**RON GOODMAN** (Aerial Photography) is president of SpaceCam Systems, Inc., the company he founded in 1989 that is regarded as the world leader in high-end gyro-stabilized cinematography. As SpaceCam designer, in 1996 he was the recipient of the Academy Award of Motion Picture Arts and Sciences for Scientific and Engineering Achievement. Recently, Ron completed design of the revolutionary SnakeHead Camera System, a fully articulated, computer-controlled, gyro-stabilized, horizontally-oriented periscope. Supporting full frame 70/15P format, SnakeHead is designed to capture the imagery associated with fast aircraft. Ron is also vice-president of StarDance Pictures Inc. and a script writer with several films to his credit.

A native of Canada, Ron has been based in Los Angeles for over 20 years. As a young cameraman and inventor, he spent 14 years in Europe where he established a reputation as a leader in aerial cinematography, contributing key material to *Star Wars* and *Superman* films and the longest single uncut shot in film history -- the final sequence in Antonioni's *The Passenger*. Over the years, many winning sequences for the Academy Award® for Cinematography have featured Ron's aerial work. He also earned the Giant Screen Cinema Films (GSCA) Best Cinematography Award in 2001, 2004 and 2007. In 2007, he also received the GSCA Film Achievement Award for his work on *The Alps*.

During his period in Europe, Ron made many engineering improvement to the original Wescam camera system, finally culminating in the launch of the "X Mount" in 1980, which was later renamed GyroSphere. At SpaceCam, he designed a totally new gyro-stabilized camera system that remains the standard in the film industry for aerial cinematography.

Today, SpaceCam is utilized in 80% of large Hollywood features. Ron also successfully developed an IMAX version of the system and has participated on numerous IMAX films.
ABOUT THE SPONSORS

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

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