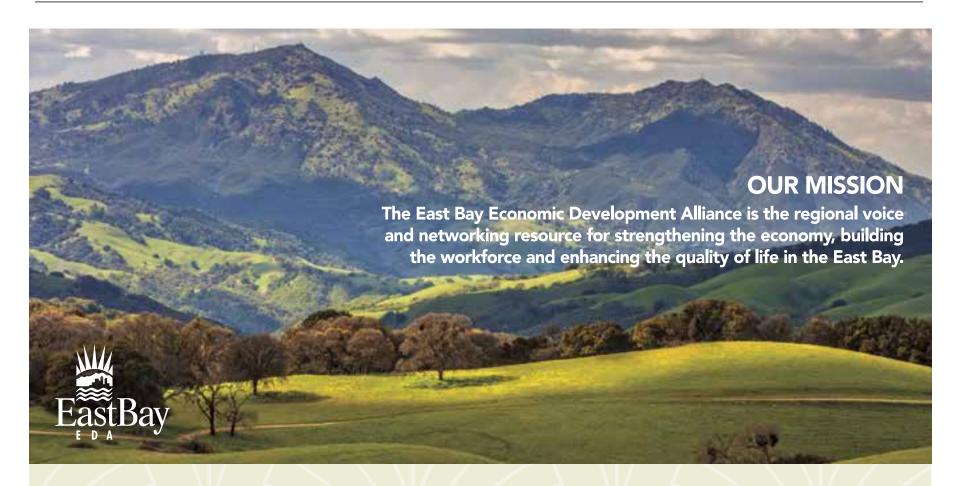


SAN FRANCISCO BUSINESS TIMES

2018 E//B/Y

INNOVATION AWARDS

www.EastBayEDA.org



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Daren Chan, Officer At-Large

Area Manager, External Affairs

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EAST BAY EDA COMMITTEE LEADERSHIP

Business Development & Resources Committee

Co-Chair: John McManus, Cushman & Wakefield Co-Chair: Diana Chavez, Working Solutions

The Business Development & Resources Committee provides strategic direction for providing resources to the East Bay's business community.

Economic Development Directors' Council

Chair: Micah Hinkle, City of Hayward Chair-Elect: Kwame Reed, City of Brentwood

The Economic Development Directors' Council convenes economic development leadership in the East Bay region to create and lead regional strategies involving business attraction and retention, regional marketing, economic data and analysis, policy reforms to improve the region's business climate, while sharing best practices/professional development.

Employer Advisory Committee

Co-Chair: Trina Ostrander, Institute for STEM Education, CSUEB Co-Chair: Judith Wetterer, Wareham Development

The Employer Advisory Committee is responsible for increasing effective employer involvement in education and workforce development in the East Bay, and promotes and supports employer-led engagement best practices to create a local STEM-skilled workforce.

International Trade & Investment Committee

Chair: James Falaschi, Vista Real Estate Partners

The International Trade & Investment Committee identifies and promotes policies, strategies and best practices that maximize import/export opportunities for East Bay companies, assistance for foreign-owned companies based in the East Bay, and foreign investment in the East Bay.

Land Use & Infrastructure Committee

Chair: Art Dao, Alameda County Transportation Commission

The Land Use & Infrastructure Committee ensures that land use and infrastructure priorities uphold the East Bay's competitive business climate, maintain efficient transportation and goods movement systems, and contribute to a high quality of life for its workers and residents.

Legislation & Advocacy Committee

Co-Chair: Ed Del Beccaro, Transwestern

Co-Chair: Buck Koonce, Lawrence Livermore National Laboratory

The Legislation & Advocacy Committee lends expertise and guides messaging to communicate East Bay EDA's perspective on important policy matters and ballot measures which may affect regional competitiveness and quality of life.

Marketing & Communications Committee

Chair: Carol Johnson, East Bay Regional Park District

The Marketing & Communications Committee is responsible for identifying and recommending regional marketing strategies to promote the assets of the East Bay.

Membership Engagement Committee

Co-Chair: Hon. Karen Stepper, Town of Danville Co-Chair: Michael Brown, Brown Gee & Wenger LLP

The Membership Engagement Committee is responsible for identifying and recommending strategies to promote the value of East Bay EDA and opportunities for membership cultivation, to enhance member experience and connectedness to East Bay EDA's work.

A MESSAGE FROM THE CHAIRMAN

Economic development and artificial intelligence



Keith Carson Chair, East Bay Economic Development Alliance; Supervisor, Alameda County, District 5

y all indications, Artificial Intelligence (AI) is everywhere – an era-defining technology. Last January, AI was the innovation sweeping not only the big Consumer Electronics Show in Las Vegas, but also the National Retail Federation's annual trade show in New York. AI can be found right now in a wide range of household appliances in local stores.

AI is software that enables machines to recognize digital patterns, make inferences and learn by trial and error. As data inputs and computing power grow, the analysis, speed of decision making, and ability to handle complex problems becomes more powerful. Autonomous vehicles and music streaming services use AI to teach themselves how to drive and what type of music to play for listeners.

But the greater the power to benefit, the greater the potential for harm. Democracy may become hard to maintain if instead of a common source of information, newsfeeds only tell each individual what they want to hear. The Internet of Things exposes us to cyberattacks through our household appliances. Reportedly, China is using AI to monitor everything its citizens do on the Internet and using facial recognition software to monitor where people go, what they buy and whom they meet. This surveillance is then aggregated into a "citizen score" that determines such things as what class train ticket can be bought, the necessity of making a large deposit and where one is allowed to shop. The scores of those in one's social network also affect a person's own score, so associating with those with lower "citizen scores" endangers privileges. A different concern of some Silicon Valley luminaries is the "singularity," the point at which machines become smarter than humans and make decisions that humans can't understand or control. AI is already surpassing humans in complex games such as chess and Go.

While economic development organizations do not have ready answers nor

'In about 30 years, artificial intelligence will have an IQ of 10,000'

Masayoshi Son, CEO, SoftBank

a set of ethical boundaries to control the outcomes of technology development, they do have an important role to play in supporting and managing the change. The leading edge of our economy is based on continuous innovation. To be successful, such an economy needs something to integrate the system. Government, education, unions, community organizations, and other partners all need to be working in harmony for business to keep up with global competition. This is becoming economic development's job and it must be done well to successfully compete with other regional economies, including those that are centrally planned.

But economic development also means supporting the communities that support the businesses and their workers. Powerful technologies such as gene editing and AI can raise questions about core values. When robots make industries such as manufacturing and logistics less labor intensive, our communities are weakened unless we find solutions for displaced workers. Communities will fail if those with generous tech salaries make housing too expensive for those providing services. Technology is forcing us to choose either convenience and security, or privacy and personal freedom.

This is why the East Bay Economic Development Alliance (East Bay EDA) has been structured as an organization of cross-sector, stakeholder leaders. To avoid a future we don't want and to create the future we desire will require more investment from everyone. It will require the creation of a common vision and motivation. I hope you will join us in achieving that.

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About the East Bay Economic Development Alliance

The East Bay Economic Development
Alliance (East Bay EDA) is a public/private
partnership serving Alameda and Contra
Costa Counties. We are the regional voice
and networking resource for strengthening
the economy, building the workforce, and
enhancing the quality of life in the East Bay.

We welcome your engagement! www.EastBayEDA.org

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Companies to watch

THE EAST BAY IS HOME TO MANY QUALITY CONTENDERS FOR INNOVATION AWARDS

BY ROBERT SAKAI,

Technology & Trade Director, East Bay Economic Development Alliance

he East Bay's creative energy is diverse and it's been around for quite a while. The world's first cyclotron was invented here by Ernest Lawrence at the University of California, Berkeley. The Sierra Club was cofounded by three Berkeley professors. The cooking philosophy known as "California cuisine" was born here. Some historians say the East Bay's Cetus Corporation, established in Berkeley and operated in Emeryville in 1971, was the world's first biotechnology company. Tesla cars and award-winning Pixar motion pictures are produced here. More recently, CRISPR, a gene editing technology characterized as having a transformative power equivalent to the discovery of the transistor, was co-discovered here. The list goes on and on.

So it's no surprise that each year the East Bay Innovation Awards competition makes it very difficult for the judges to select only one finalist and one awardee for each competitive category. In truth, there are no losers. This year is no different, and it is a testimony to the quality of the competition that the two companies below were not selected to be finalists.

Mango Materials in Albany is a small startup that has developed a way to use bacteria to produce poly-hydroxyalkanoate, PHA, a naturally occurring biopolymer. Mango's PHA powder can be used to make biodegradable plastic that is environmentally superior to the widely used petroleum-based plastic that has created miles of ocean waste and fatal hazards for wildlife. Mango's polyester provides a green solution for the

\$2 trillion fashion industry, and the 60% of our clothing that contains polyester. It could be used to replace plastic in children's toys, electronic casings, water bottles and food packaging. In addition, Mango's process uses waste methane that is produced by the breakdown of organic material in landfills, and the plastic costs no more than petroleum-based plastic. Today, Mango is working on a specific plastic formulation to solve the environmental problem created by the waste of 250 billion plastic container caps that are produced annually.

Pleasanton's 10x Genomics has created a powerful system of tools, including reagents, instrumentation, and software, for studying the dynamics of gene expression more efficiently and in more detail than with previous tools. Using 10x Genomics' tools, researchers can now quickly analyze thousands of cells individually to measure how RNA, ribonucleic acid present in all living cells, affects the expression of an organism's genes in different tissues, under different conditions, and at different points in time. 10x Genomics' tools quickly eliminate millions of pipette steps that would otherwise be necessary to categorize cells, identify rare cell types and isolate significant genes. This information can then be used to better understand an organism's biology, the functions of previously unannotated genes and the progress of human disease.

Although neither of these two companies made it to the finals of this year's competition, they, and so many others like them, should be strong contenders next year. And who knows what creative minds, technology and ingenuity will bring about for the 2019 East Bay Innovation Awards?



Innovation from the bright side of the Bay

THE EAST BAY SHINES WITH WORLD-CLASS TALENT, OPPORTUNITIES AND QUALITY OF LIFE



UC Berkeley. The East Bay cultivates a wealth of new talent through its colleges and universities.

BY AARON WELCH

Writer, VerbFactory

o matter where in the world you go, mentioning that you live in the Bay Area is guaranteed to get a positive response – even in Los Angeles. Technology buffs will automatically mention Silicon Valley. People who follow the world of venture capital will most likely refer-

The East Bay keeps making headlines, from award-winning beer to biomedical breakthroughs. ence Sand Hill Road. And of course, just about everyone loves San Francisco, one of the world's most iconic and vibrant cities. But what about everything on the other side of the Bay Bridge? Well, that's still a pretty well-kept secret. But not for much longer.

Everywhere you look, something from the East Bay is making headlines, from award-winning beer to biomedical breakthroughs to new laser technologies. Even the sports car that's currently headed to Mars (accompanied by a David Bowie soundtrack) was built in Fremont. So what exactly is going on in the bright side of the Bay, and why is it one of the world's great ecosystems for innovation?

For starters, unlike just about every local sub-region (including San Francisco, the Peninsula, and Silicon Valley), the East Bay isn't hemmed in by natural boundaries. That creates massive opportunities for businesses and academic institutions, but it also eliminates the need for maximum density. So while there is groundbreaking work going on in Berkeley, Alameda, Oakland, Livermore, Concord, Fremont and other towns and cities, it's spread out over hundreds and hundreds of square miles. That's good for commute times and rents, but it also makes it more difficult to point to a single spot on the map as "ground zero" for where the magic happens.

Keep on looking to the east

So what makes the East Bay so dynamic that it boasts the world's only reserved parking spaces for Nobel Prize winners? It all starts with one of California's best post-secondary education ecosystems that churns out amazing graduates every single year. The only way to sustain excellence is with new talent, and thanks to a network of community colleges and four-year universities (including UC Berkeley, Mills College and Cal State University East Bay), that pipeline doesn't look like it will run out anytime soon.

Just as important are three National Laboratories that draw talent from around the world and also serve as centers of innovation for the East Bay. Not only do the labs attract



Research in the Molecular Foundry lab, above, and open house, below, at Lawrence Berkeley National Laboratory.



top-caliber scientists to the area, but they also play a critical role in the local start-up community. And Berkeley's Cyclotron Road has become a global "go-to" destination in recent years thanks to the concentration of world-class researchers and engineers.

But the number one factor that makes the East Bay unique is the people. Just as the Bay Area is known for microclimates that can vary block by block, there are distinct personality traits that make each region special. The East

Bay tends to be far more supportive and inclusive than other local areas with coordinated efforts to develop local talent and industry clusters, while at the same time the technical and business expertise of its residents is second to none. Mix in more affordable real estate, amazing diversity and a pleasant climate with plenty of open space, and it's hard to beat the East Bay as a global leader in innovation. The East Bay in many ways is indeed the "bright" side of the Bay.



East Bay Regional Park District: A legacy of innovation

EAST BAY

INNOVATION

LEGACY

AWARD

WINNER

East Bay

Regional Park

District

BY CAROL JOHNSON,

Assistant General Manager, East Bay Regional Park District

ost people don't think of a governmental agency as an innovator. But there's at least one in the East Bay that should be top of mind for its creative, forward-thinking resolutions: East Bay Regional Park District (EBRPD).

As the largest regional park agency in the United States, EBRPD leaders have been innovating since its founding in 1934 in the depths of the Great Depression. In fact, it was during this tumultuous economic period that vi-

sionary civic leaders in Oakland and Berkeley initiated a campaign to tax themselves to create this public park incubator.

Today, EBRPD consists of 73 parks and over 121,000 acres across Alameda and Contra Costa counties, hosting 25 million visits annually – roughly the same amount of visitation that Disneyland gets annually! Innovation was part of the Park District's founding, and it continues to be a driving force for how the Park District

operates for today's visitors and for future generations.



Carol Johnson,
Assistant General
Manager, East
Bay Regional Park
District

Planning from a regional approach

The Park District looks holistically at the East Bay to ensure there are opportunities for residents to get outside within ten minutes regardless of where they live or work. Before "regionalism" was ever considered, EBRPD was carefully evaluating alignments to allow for acquisition of new parklands and trails that effectively stitch together communi-

ty connections through publicly accessible corridors. The municipal fabric of today's East Bay is largely built

around the open spaces, meaning that vehicles are not necessary to commute from one end of the county to the other. Green transportation corridors, also known as regional trails, already connect commuters to other mass transit like BART and bus lines. The Iron Horse Trail alone carries hundreds of thousands of users annually, traversing both Alameda and Contra Costa Counties and connecting nine communities and four BART stations.

Employers in the East Bay also benefit from the Park District's recreational amenities when green transportation options improve the quality of life of their employees. For example, Bishop Ranch Business Park in San Ramon connects directly to the regional trails and it markets this amenity to its tenants.

The natural environment stimulates the economy.

Thanks to a scientific, longitudinal analysis by Bay Area economists, the economic value of the Park District is now better understood. A 2017 study, and the associated report entitled "Quantifying the Quality of Life," is a groundbreaking assessment that concludes that the Park District is an integral part of many aspects of life in the East Bay. More specifically, EBRPD:

- Provides a range of benefits to residents, businesses, and visitors that total about \$500 million annually. This includes the values of recreation, health-care, property values, and other ecosystem services.
- Generates nearly \$200 million in regional economic activity every year that would not happen without the District.

In addition to these benefits, the Park District is a good investment. Based on the District's annual budget of \$147 million, every \$1 yields a return of \$4. This means that all Alameda and Contra Costa County taxpayers, regardless of background, are getting good value for investments in the Park District.

Healthy Parks = Healthy People.

The importance of spending time in nature to recreate, relax and reduce stress is still as relevant today as it was to the District's founders eight decades ago. Today's off-the-charts stress demands such outlets for balanced living. EBRPD partners with over a dozen hospitals, clinics and universities, including UCSF Benioff Children's Hospital Oakland, where they medically prescribe time in nature for people dealing with physical and mental health issues. And if people can't get out to a park, EBRPD has two mobile visitor centers to bring the parks to the people. Large photographs of East Bay hills grace the halls at Children's Hospital and clinics in Antioch and Pittsburg providing calming images for both staff and patients.

Inspired by their award-winning Parks Rx collaboration with the medical industry, EBRPD and the Golden Gate National Recreation Area have created a Bay Area Healthy Parks Healthy People initiative, signing on all nine county park systems to establish health related activities in parks and nature settings.

Our climate future.

And yes, climate change is occurring and neighborhoods along Bay Area shorelines are at risk of flooding. EBRPD is playing an important role in preparing for this

future by initiating climate resiliency projects in its shoreline parklands to buffer these endangered neighborhoods. Some of EBRPD's projects include:

- A Renewable Energy System installed at Shadow Cliffs Regional Park generating enough power to offset nearly all of the Park District's electricity use.
- Development of a greenhouse gas emissions reduction plan including changing over much of the District's fleet to electric or energy efficient vehicles.
- Careful forest management thinning of trees to reduce fires while maintaining high carbon sequestration.
- \blacksquare Increased efforts to prevent beach erosion and protect infrastructure from imminent sea level rise.

The East Bay Regional Park District has been an innovative force of nature in the East Bay since 1934, and will continue to be so for future generations. Thanks to the continued support from taxpayers who value the enhanced quality of life provided by EBRPD, public support has never been higher for parks, open spaces and trails.



"CCTA wants to encourage sustainable economic development with high-tech, forward-looking jobs right here in our backyard."

Randy Iwasaki, Executive Director, CCTA

Autonomous vehicles put to the test

WINNER

Contra Costa Transportation Authority/ **GoMentum Station**

ccta.net gomentumstation.com

Innovation: Autonomous vehicles testing ground and

public-private partnerships **Location:** Walnut Creek/

Concord

Executive Director:

Randy Iwasaki

Employees: 20 (CCTA)

Operating budget:

\$127.5 million

Regional significance: Making Contra Costa County a center for autonomus vehicle innovation

East Bay favorite: Our beautiful weather

he last thing most people are looking for on their commutes is a rough road. But that's just what autonomous vehicle manufacturers and technologists need to prove their products are ready for public streets. For many businesses, the search for the right testing facility takes them to the East Bay's very own GoMentum Station.

Located in Concord, CA, GoMentum is the country's largest secure testing facility for autonomous and connected vehicles. The station is managed by the Contra Costa Transportation Authority (CCTA), the local transportation planning agency. It is built on an innovative public-private partnership model which gives businesses the resources they need to innovate while the public benefits from access to new technologies as they're being developed.

"Despite everyone's best efforts, the driving environment can be pretty chaotic at times," says CCTA executive director Randy Iwasaki. "Companies need to make sure their autonomous vehicles can handle the pressure of real-life driving conditions before putting these machines on the road with people."

The site itself sits on 5,000 acres of a former naval weapons development center – 2,100 acres of which is licensed for testing. The space includes a variety of standard and non-standard road conditions for autonomous vehicle



The GoMentum Station test site includes a variety of standard and non-standard road conditions.

manufacturers and technology companies to test their inventions on, including parking lots, hills, railroad crossings, roads arranged in grid patterns, tunnels and more.

At a broader level, the station is part of a multi-agency effort to make Contra Costa County a center for autonomous vehicle development. "We have the competitive advantage of having a lot more space here in the inland East Bay, but for that same reason a lot of our residents have to commute long distances to their jobs," Iwasaki says. "CCTA wants to encourage sustainable economic development with hightech, forward-looking jobs right here in our backyard. It's projects like GoMentum that will secure our economic future and ultimately increase the quality of life for citizens in our county and neighboring areas."

Sunny future for Fremont roofing company

FINALIST

PetersenDean Roofing & Solar

petersendean.com

Innovation: Integrated sales-to-installation solar energy

Location: Fremont

VP of Consumer Sales:

Tim Ramage

Employees: 2800 (500 at HQ & East Bay offices)

Regional significance:

Making solar power affordable and available for the western US

East Bay favorite: Big-city advantages with a smalltown atmosphere

t's almost impossible to drive around the Bay Area and not see solar panels on homes and offices. That's hardly a surprise. After all, Northern California has long been a leader in the green revolution, and our amazing weather makes it ideal to collect energy from the sun. Not surprisingly, a local company is playing a key role in making solar power affordable and available in the Western United States.

Fremont-based PetersenDean was started by two high school friends, Jim Petersen and Joe Dean, who grew their business into the country's largest roofing subcontractor. In fact, more than a quarter of all new construction roofs in Northern California were installed by the company last year. So when the solar boom began, PetersenDean was perfectly positioned to work with builders to install panels, and within a few years the company was selling directly to consumers under its own name.

Tim Ramage, the company's VP of Consumer Sales, says that the transi-



Jim Petersen, Co-founder, PetersenDean Roofing & Solar

PetersenDean was started by two high school friends who grew their business into the country's largest roofing subcontractor, then became a major provider of solar panels.

portunity to manage the entire process into trouble. from sales to installation rather than working as a subcontractor. We're basically a five-year-old startup inside a very stable and successful 34-year-old company, so it really is the best of both worlds."

For PetersenDean, expertise in financing is just as important as its deep knowledge of designing and installing systems. The company offers six different options that have helped it thrive

tion was a natural one. "We saw an op- even as other solar providers have run

One of the basic rules of business is that "location is everything," and for PetersenDean, Fremont is the perfect headquarters. "We really have everything we need right here, from great technology in Silicon Valley to a culture of innovation to amazing talent," said Ramage. "Our customers and prospects have a lot of questions, and our worldclass team right here in the Bay Area can answer all of them."



"Being in the East Bay means we have access to smart, hard-working people."

Phil Quinton, VP of Business Development, Therm-x

Perfecting the art of temperature control

WINNER Therm-x

therm-x.com

Innovation: Custom temperature control solutions for advanced manufacturing

Location: Hayward VP of Business Development: Phil Quinton

Employees: 290

Regional significance:

Enabling manufacturers to break through temperature-related limitations

East Bay favorite:

Berkeley's Greek Theater and Livermore wine country f you've ever burnt a batch of cookies in the oven, then you know how important precise temperature control can be. The trouble is, most ovens cycle within a temperature range of 25 degrees or more, frustrating many would-be bakers. But while maintaining proper temperature control for food preparation is difficult, it's nothing compared to the precise temperature ranges required for semiconductor manufacturing.

A famously complex and involved process, manufacturing semiconductors can only occur under extremely controlled conditions. And as semiconductor manufacturing has become more advanced, temperature variation has become more of a critical factor.

That's why major chip makers and semiconductor equipment providers like Applied Materials, Lam Research, and Intel turn to Therm-x, the Hayward-based temperature control specialists, for their custom temperature control solutions. Initially founded in 1985 as a wholesale distributor, Therm-x transitioned to research and design in the mid-1990s to get in on the semiconductor manufacturing powering the era's tech boom, says Phil Quinton, VP of business development.

"We attack heat-related problems," Quinton says. "Temperature control is often one of the limiting factors in semiconductor manufacturing. Our custom solutions help manufacturers break through those limits and build smaller, faster and better chips."

In addition to supplying technologies that enable advanced



Therm-x makes custom temperature control solutions for high-tech clients.

semiconductor manufacturing, Therm-x designs, engineers and customizes temperature solutions for alternative energy, aerospace, automotive and food applications, among other industries in which temperature plays an essential role in production.

One of the organization's strategic advantages has been their location in the East Bay and their involvement in the community, Quinton notes. "Being in the East Bay means we have access to smart, hard-working people, which is essential when you're developing new technologies," he says. "We've had a great deal of success hiring individuals from local universities."

More than a dozen Therm-x employees hail from California State University, East Bay, where the company also offers hands-on, project-based internships to college seniors. "We find that the students not only have the technical knowledge, but also the kind of energy and enthusiasm required for the work."

Helping the world move more smoothly

FINALIST BishopWisecarver

bwc.com

Innovation: Low-friction, "self-wiping" linear and rotary actuators

Location: Pittsburg **President:** Pamela Kan

Employees: 59

significance: Enabling movement for MRIs, satellites, lab equipment, food-processing equipment and more around the world

East Bay favorite: Hiking Ridge Top trail with my dog in Shell Ridge Open Space ncorporated in 1950 as a custom parts and machine builder, Bishop-Wisecarver (BW) has gone through multiple incarnations in the past nearly-70 years. Present throughout the long-running and evolving business, however, has been a consistent theme of movement.

In the early years, that meant supplying product and accessories to the baking and trucking industries. Today, that means working with manufacturers to design, engineer and build reliable motion solutions for a wide range of customers from Fortune 500 businesses to government and medical organizations.

"Everything needs to move somehow," says Pamela Kan, second-generation owner and president of BW. "Our products are key to automating many of today's machines and robots that are so essential to modern life."

Take the company's linear and rotary actuators, for instance. These mechanisms, providing smooth, sliding movement across straight and circular lines, are used in MRIs, satellites, lab equip-



"Our products are key to automating many of today's machines and robots"

Pamela Kan, Owner and President, Bishop-Wisecarver

ment, food-processing equipment, and even landmine detection, among other applications.

The complexity and the importance of these applications means that not all actuators are up to the task. The key to BW's success has been the company's innovative design, which is inherently low-friction and "self-wiping," as Kan puts it, allowing its actuators to perform well for years in challenging environments, including clean rooms, the outdoors and environments filled with contaminants such as food, sawdust, chemicals and metal shavings.

BW became a Women's Business Enterprise National Council-certified business in 2011, acquiring certification from the largest third-party certifier of businesses owned, controlled and operated by women in the United States. BW is proudly headquartered in Pittsburg, CA. Building on a long history of involvement in the East Bay, the company works with local high schools and colleges to introduce young people to what manufacturing is all about. BW's participation in "National Manufacturing Day," for example, allows students to tour the BW factory and see what a modern 21st century manufacturing facility really looks like, helping to weaken negative stereotypes about manufacturing jobs and businesses.

Pushing the limits of manufacturing with additive technologies

FATHOM IS BUILDING THE FACTORY OF THE FUTURE

We need a seamless

partnership of

manufacturers and

educators, as well

as workforce and

economic development

organizations.

BY RICH STUMP, Co-Founder & Principal at FATHOM

oday's consumer products are smarter, users are more empowered, and product development demands are increasing quickly

but access to a wide variety of advanced technologies to solve these challenges has never been more real. Gartner, a leading research and advisory company, predicts that the global 3D printing market is projected to reach \$17.7 billion by 2020 — representing a 5-year compound annual growth rate (CAGR) of 66.5%.

Right now, you have the opportunity to push the limits of how to design and manufacture products in very big ways — 2018 is going to be the breakthrough year for additive technologies. A perfect storm is stirring. Many factors are coming togeth-

er and it's an exciting convergence of new technologies with traditional methods, new materials with maturation of existing processes, rising consumer demands with the need for mass customization, and increasing awareness with growing desires for more education on current applications, to name a few.

It is extremely important for the East Bay to continue to invest in innovative technologies that lead the way.

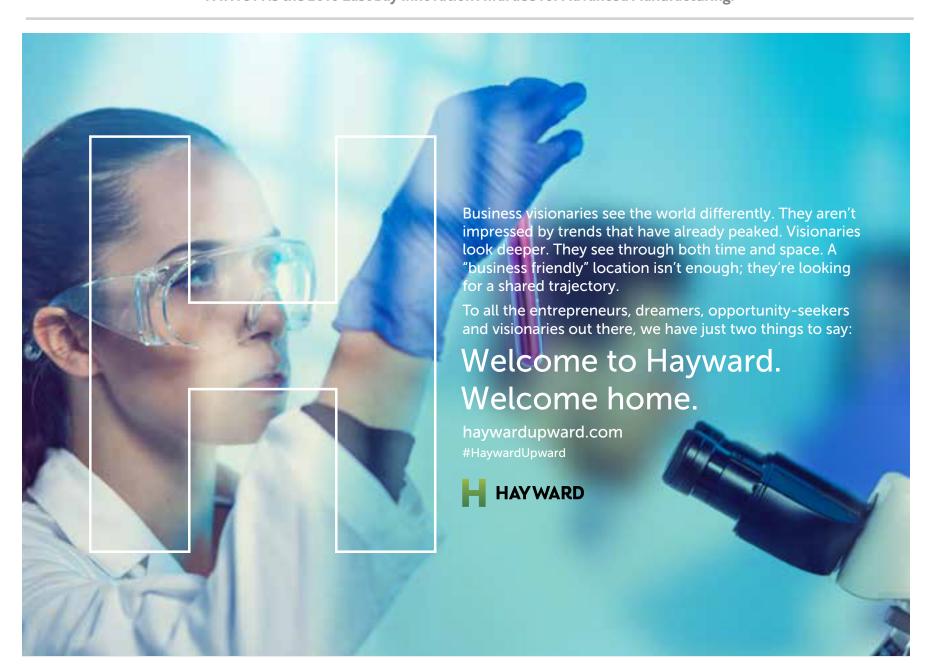
For the region to rise to the occasion, we need a seamless partnership of manufacturers and educators, as well as workforce and eco-

nomic development organizations — keeping in mind the importance of manufacturers taking the lead in aligning all partners with the needs of emerging technologies. This is where great partnerships come into play—AMBayArea (Association of Manufacturers Bay Area), the Biomedical Manufacturing Network, and the Bay Area Urban Manufacturing Initiative all help to strengthen manufacturing in our local area.

While many futurists have overspeculated 3D printing and additive manufacturing, the FATHOM team has been busy building a factory of the future

with these proven technologies. Strategically headquartered in the East Bay, FATHOM is honored its work has earned recognition as one of the fastest growing companies in America year-over-year by several respected publications including *Inc.* magazine, the *San Francisco Business Times* and *Fortune*.

FATHOM is the 2015 East Bay Innovation Awardee for Advanced Manufacturing.



A better electric grid empowers renewables

WINNER Smart Wires Inc.

smartwires.com

Innovation: SmartValve power flow control technology

Location: Union City

SVP, Design Commercialization:

Paul Phillipsen

Employees: 65

Regional significance:

Empowering renewable integration across the country

East Bay favorite:

Convenient access to world-class entertainment

lectricity is such a key part of our lives that we don't even notice it or think about it until there's a problem and everything goes dark. All of a sudden everything that we take for granted, from using our computers to making phone calls, is impossible – and we remember how critical it is to have a reliable power grid. And that doesn't just happen by itself.

Enter Smart Wires, a Union City-based technology startup that empowers utilities to optimize their transmission lines to be both efficient and reliable. "Today's power systems are doing far more than they were originally designed to do, which is pushing them to their limits," says Paul Phillipsen, the company's senior vice president of design commercialization. "We built the first 'valve' to physically control the flow of power to push power away from congested lines and onto underutilized paths and unlock the excess capacity that exists on utilities' networks."

"It's a technology that's particularly important as utilities continue to shift towards renewable energy sources, which produce less consistent outputs than traditional power plants," Phillipsen adds.





"We built the first 'valve' to ...
unlock the excess capacity that
exists on utilities' networks."

Paul Phillipsen, Senior Vice President – Design Commercialization, Smart Wires Inc.

Smart Wires is the 14th company founded by serial entrepreneur Woody Gibson, who came across grid-related intellectual property developed at Georgia Tech and licensed it from the school in 2011. Phillipsen says that the company opened its first office in Oakland City Center because it had "really great infrastructure, communications, transportation, and was convenient for accessing the great communities of the East Bay." A year later, Smart Wires opened its R&D

facility in San Leandro, and today the company occupies a 44,000 square foot facility in Union City.

Phillipsen says that Smart Wires is excited to continue its rapid pace of innovation to modernize the transmission grid. "We're not slowing down, and we have several great new products in the pipeline. And we wouldn't be able to do it without access to experts in the Bay Area and to the pool of innovators here in the East Bay."

Putting solar power to work for everyone

FINALIST GRID Alternatives

gridalternatives.org/ bayarea

Innovation: Connecting job seekers with renewable energy employers

Location: Oakland

Bay Area Regional

Director: Renée Sharp

Employees: 60 (East Bay)

Operating budget: \$4.7 million

Regional significance:

Making renewable energy technology and job training accessible to underserved communities ounded in 2001 in the East Bay by engineering professionals Erica Mackie and Tim Sears, GRID Alternatives is a non-profit organization whose mission is to make good on the principle that free, clean electricity from the sun ought to be available to everyone.

To Mackie and Sears, that means more than just ensuring that low-income communities have access to solar panels. It means taking a broader approach that sees solar as a solution to persistent economic issues in these communities. That's why GRID Alternatives offers a hands-on "classroom in the field" program, to help disadvantaged populations find employment in a growing industry.

"Our vision is to ensure that the ongoing transition to clean, renewable energy includes everyone, particularly low-income communities and communities of color," says Bay Area Regional Director Renée Sharp. "The development of the renewable energy sector is a huge opportunity to put money back



"We now have the opportunity to re-think what our energy systems will look like in the future and it's critical that we choose wisely."

Renée Sharp, Bay Area Regional Director, GRID Alternatives

into families' pockets and jumpstart new careers for those living in underserved communities."

To date, GRID has installed more than 9,000 solar systems across the country that will provide lifetime cost savings of more than \$300 million and prevent 830,000 tons of greenhouse gas emissions. They've also trained more than 35,000 participants in solar installation, offering special programs for women, high school-aged youths, and veterans that help connect job seekers with employers.

GRID has also expanded their reach through partnerships with tribal communities—working with more than 40 Native American tribes to help improve quality of life through solar energy—and entered the global arena with investments in rural off-grid communities in Nicaragua, Nepal and Mexico, providing electricity for schools, health clinics, homes, and more.

"As a global community, we now have the opportunity to re-think what our energy systems will look like in the future and it's critical that we choose wisely," Sharp says. "Renewable energy can drive economic growth and environmental benefits in communities most impacted by underemployment, pollution and climate change. GRID wants to make this path a reality."

Berkeley Lab: Public-private partnerships lay the foundation for innovation

National economy benefits from Berkeley Lab spinoffs

BY KERI TROUTMAN, Office of Strategic Communications, Lawrence Berkeley National Laboratory

ounded in 1931, Lawrence Berkeley National Laboratory
(Berkeley Lab) fosters groundbreaking fundamental scientific research that enables transformational solutions for energy and environmental challenges. Located near UC Berkeley, Berkeley Lab draws approximately 3,304 local scientists, engineers and support staff into the East Bay economy.

Berkeley Lab is part of the U.S. Department of Energy's national laboratory system. Managed by the University of California and charged with conducting unclassified research across a range of scientific disciplines, Berkeley Lab contributed \$142 million in procurements to California businesses and awarded \$97 million in contracts to small businesses in 2016.

Spinoffs from Berkeley Lab research contribute billions to the national economy in savings and revenue, and the Lab is developing ways to accelerate the transition from basic to applied research, including new approaches to technology transfer and through the Department of Energy programs that bring local businesses and entrepreneurs into partnerships with Berkeley Lab.

Berkeley Lab is a global leader in energy-efficient technologies. Its research program for science-based efficiency standards for appliances directly increases the nation's energy independence, drives economic growth, and creates and protects manufacturing jobs in the United States. Advances in building and lighting technologies based on Berkeley Lab's energy efficiency research enable early stage development of cost-effective applications that sustain the health and productivity of American citizens. Berkeley Lab's foundational work in lithium ion batteries has led to numerous scientific breakthroughs, including a recent discovery that marks a major step toward making solid-state magnesium-ion batteries that are both energy dense and safe.

From buildings and lighting to batteries and fuel cells, Berkeley Lab offers opportunities for researchers and developers to test, demonstrate, and validate innovative energy efficient technologies. Nearly 48 startups were founded on Berkeley Lab-developed technology, creating more than 2,000 new jobs. Berkeley Lab technologies have been licensed in the biotechnology, energy efficiency, nanotechnology, IT, materials discovery, semiconductor manufacturing, subsurface modeling and health fields.



Connecting citizens for smart cities

WINNER **PilotCity**

pilotcity.com

Innovation: Scalable, cross-industry, employer-driven workforce incubator

Location: San Leandro

Chief Architect of Policy: Derick Lee

Employees: 12

Regional significance:

Developing prototype ecosystems for smart city innovation

East Bay favorite:

Perspectives from all the diversity we represent

eople can't wait for smart cities to change their lives. Self-driving cars eliminating traffic, smart energy reducing pollution, advanced data analytics improving citizens' quality of life – it's an exciting vision, to be sure. But who's going to actually build it all?

Even the smartest cities can't design and build themselves - at least not yet. Until that day, smart humans will be the key to fulfilling the promise of smart cities. Taking up that charge is San Leandro-based PilotCity, whose workforce incubators are cultivating the next generation of entrepreneurs and innovators.

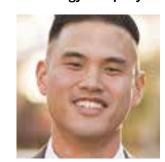
"Connected citizens are the key to smart cities," says founder Derick Lee. "PilotCity focuses on bringing people together from across sectors to incubate new ideas that will improve our lives."

In the case of the organization's workforce incubator, that means bringing together tech employers, teachers and their students to create prototypes in the classroom that lead to pilot projects. PilotCity's employer-driven fellowships, for example, bring scalable industry-based learning to Alameda County teachers and students.

Why start with students? "We asked ourselves, 'Where is the single place in a community that's guaranteed to have people from the city, and who also care about it?' Schools are those places," Lee says. "Moreover, with a 7-10 year turnaround you could have an entirely new generation of forward-looking citizens that are able to build the future of their own cities," he adds.



Technology company SE3D Bioprinters hosts a class at PilotCity.



"PilotCity focuses on bringing people together from across sectors to incubate new ideas that will improve our lives."

Derick Lee, Founder, Pilot City

For an example of the power of non-traditional collaborations, one needn't look further than PilotCity itself. "I like to say that PilotCity came about because I forgot my glasses one day," Lee says. "Sitting in the very front row of an event, it led me to meet Deborah Acosta, San Leandro's Chief Innovation Officer, who was hired to build the city's ambi-

tion to become a city of innovation."

The two instantly jelled and the vision for PilotCity gradually formed thereafter. "It's a story of how unexpected encounters can lead into serendipitous commitment to transforming your hometown," Lee says. "And there are thousands of young people in our cities willing to make this commitment."

Refurbishing computers has double benefit

FINALIST Tech **Exchange**

techexchange.org

Innovation:

Repurposing technology for citizens in need

Location: Oakland

Executive Director: Seth Hubbert

Employees: 13

Operating budget: \$1.3

Regional significance:

Bridging the digital inequality divide in the Bay Area

East Bay favorite: Yearround gardening!

educe, reuse, recycle-it's a mantra we're all familiar with. But like many turns of phrase, the slogan's true meaning has diluted over time. The message isn't that these three approaches to conservation are all equally effective, it's that there is a hierarchy, and that where possible, reduce and reuse are the more environmentally-friendly mechanisms.

Adherence to that principle is at the core of Bay Area nonprofit Tech Exchange's mission. So too is a dedication to maximizing digital equity for East Bay residents. Repurposing and refurbishing donated computers is where these environmental and social missions intersect.

Tech Exchange is addressing a critical and often overlooked aspect of the digital divide: baseline technology access. Executive director Seth Hubbert says, "Without home computers and internet, how can we expect students to learn the technology skills they need to be competitive in today's workplace or attain higher level skills like coding?"

Tech Exchange is the only local orga-



"Businesses can simultaneously reduce their environmental footprint and contribute to addressing digital inequities."

Seth Hubbert, Executive Director, Tech Exchange

nization putting computers directly into homes, and they work alongside the East Bay Broadband Consortium, Get Connected Oakland, and other local initiatives to strategically solve for all digital inequities in the East Bay.

Each year, Tech Exchange provides around 4,000 refurbished computers to the East Bay community, and in the last twelve months alone they've helped more than 2,500 families get connected. The environmental savings add up, too. Using an EPA cost analysis, Tech Exchange is calculated to have generated over \$1.8 million in environmental cost savings through its work.

"Eighty-one percent of a computer's en-

ergy use is in making it, not using it, and analyses show that it's actually about 12 times more environmentally responsible to reuse rather than recycle computers," Hubbert says. "Through Tech Exchange's tech-repurposing model, businesses can simultaneously reduce their environmental footprint and contribute to addressing digital inequities in the East Bay."

All businesses have to do is request a pickup, Hubbert adds. "Tech Exchange handles the rest, including scheduling, chain of custody tracking, and secure data destruction. It's just as easy for businesses—if not easier as disposing or recycling decommissioned technology through other means."

Creating a diverse STEM workforce

College prep program supports talent in under-represented minorities

BY ELI KENNEDY, Chief Executive Officer, Level Playing Field Institute

s an Oakland high school student, Haile Shavers took apart her home computer. Her mother was concerned, less about the computer, and more about Haile shocking herself. Thankfully, Haile, and the computer, turned out fine. Little did she know her curiosity would eventually lead her to study at UC Berkeley. Today, Haile – who is African American – is a fourth-year undergraduate at UC Berkeley studying cognitive science, and she's one of the few women of color in this field.

Her college life actually began when she was a scholar at SMASH (Summer Math and Science Honors Academy), the signature STEM (science, technology, engineering and math) program of the Level Playing Field Institute (LPFI) – the education arm of last year's Catalyst of the Year winner, the Kapor Center.

SMASH is a free-of-cost, STEM-intensive residential college preparatory experience held on college campuses across the country. Through a culturally relevant curriculum and campus residency, underrepresented scholars of color are exposed to the mentorship, academic rigor, and networks needed to pursue successful STEM careers.

SMASH started at UC Berkeley in 2004, and has spread to

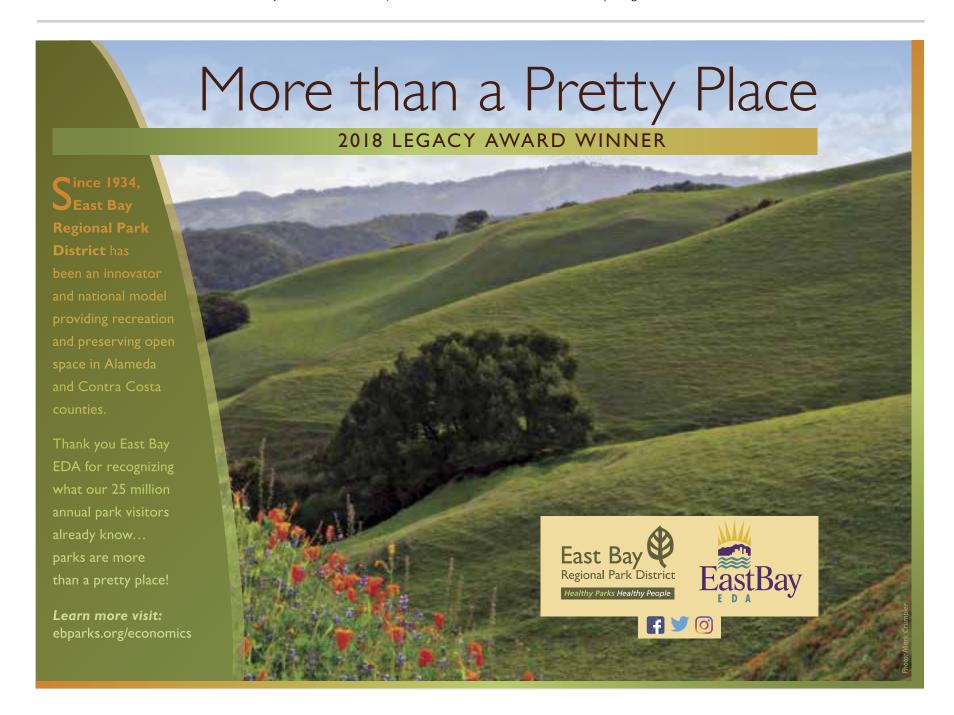
Stanford, UCLA and UC Davis. Nationally, SMASH is at Morehouse College in Atlanta and will launch new sites at Wayne State University in Detroit and The Wharton School at the University of Pennsylvania in Philadelphia.

SMASH's comprehensive approach boasts significant results:

- 100% of SMASH alumni graduate from high school.
- 93% of SMASH alumni complete a Bachelor's degree, 43% higher than the national average.
- 55% of SMASH alumni complete a Bachelor's degree in a STEM field, a rate over 1.5x higher than the national average.

SMASH develops and supports the untapped geniuses who will shape STEM and tech for years to come. Through SMASH's proven approach and the urgency of this critical moment in history, LPFI works to ensure the STEM industry will reflect the diversity of our nation. According to Haile, "SMASH allowed me to be around folks who looked like me, who are fueled by the same type of motivations that I have, and just want to do well and be successful."

Level Playing Field Institute Scholars participated as youth co-presenters for the 2018 East Bay Innovation Awards. For more information, visit www.lpfi.org



3-D sensors at the heart of autonomous vehicles

WINNER Velodyne LiDAR

velodynelidar.com

Innovation: Laserbased 3D scanners

Location: Alameda

President: Marta Hall **Employees:** 575 (70 in

Alameda)

Regional significance:

Real-time 3D data enables autonomous vehicle navigation, mapping and more

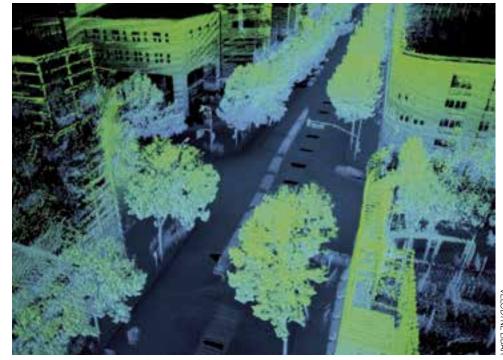
East Bay favorite:

The art scene!

n 1885, Karl Benz drove the first Motorwagen out of his shop, and for more than 130 years pretty much every car trip has been just like the first: the driver sits down in a seat, turns the engine on, and uses a combination of pedals, switches and wheels to control the vehicle. If David Hall, CEO of Velodyne LiDAR, has anything to say, that approach could soon be as old-fashioned as using a crank to get the motor running.

Hall's Alameda-based family business started life as a speaker manufacturer in 1983, but the DARPA Grand Challenge led the company to make a sharp left turn away from subwoofers and into the world of self-driving vehicles. "The challenge was to make autonomous cars that could make it around a track," says company president Marta Hall. The first year, none of them could. David Hall realized that three-dimensional vision systems were the key to success, and everyone else was using 2D cameras. "David built our LiDAR system, and the very next year all of the cars using our technology finished the race. We really 'pressed go' on self-driving vehicles."

LiDAR (an acronym for "Light Detection



The image perceived by a Velodyne LiDAR sensor.



"We are very excited about the idea that our sensors can start creating more safety on the roadway."

Marta Hall, President, Velodyne LiDAR

and Ranging), better known as laser-scanning, relies on reflected light to calculate distance between objects. "Ninety-four percent of crashes are caused by human error, which is why we are very excited about the idea that our sensors can start creating more safety on the roadway," Hall says.

Velodyne LiDAR currently has about

550 employees, but is rapidly growing as demand grows for the company's products in industries such as security, trucking, agriculture and mining. Hall says, "We're proud of the company, and we're proud to be in Alameda. This is our home, and we love being able to grow our team right here at home."

Providing keys to keeping hospitals healthy

FINALIST Key Source International

ksikeyboards.com

Innovation: LinkSmart medical keyboard

Location: Oakland **National Sales**

Director: Deanne Vankirk

Employees: 25 Regional significance:

Reducing spread of disease and keeping data secure at hospitals around the country

East Bay favorite:

Access to year-round ice skating for me and my daughter

y definition, you go to the hospital to get better. Unfortunately, it's not uncommon for patients to be discharged with something other than a clean bill of health.

The Centers for Disease Control and Prevention finds that about one in 25 hospital patients is diagnosed with a healthcare-related infection each year. And it's easy to see why: The hospital environment offers an infinite number of opportunities for viruses and bacteria to find their way onto pretty much any surface.

Key Source International, a smart keyboard manufacturer based in Oakland, CA, is acutely aware of the problem, says Deanne VanKirk, who serves as national sales manager for the company. "That's why we developed our healthcare keyboard solutions - to help stop the spread of infections and ultimately save patients' lives."

Founded in 1952 as a keycaps manufacturer, the company expanded into manufacturing keyboards for point of sale systems before developing their current



"Few surfaces are handled with as little thought about harmful germs as a computer keyboard."

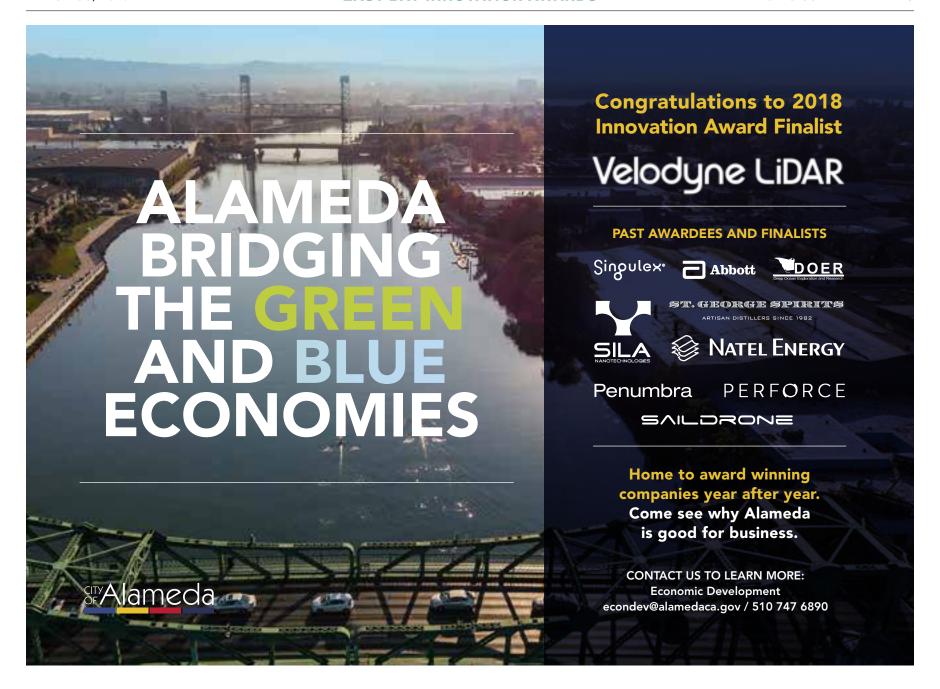
Deanne VanKirk. national sales manager. Key Source International

lineup of healthcare solutions. Known as "LinkSmart," Key Source's award-winning medical keyboard is an unconventional, multi-faceted, intelligent tool for the clin-

Made in Oakland, the LinkSmart is scrubbable, sprayable, and disinfectable with germicidal wipes, and further enhanced by the company's patented Sana-Key software that enforces rigorous keyboard cleaning protocols via user-defined scheduling and data collection. LinkSmart also includes analytics and sensing technology that detects which portions of the keyboard surface have and have not been cleaned, down to the individual key.

But Key Source products address more than disinfection. Cybersecurity, particularly related to data privacy regulations such as HIPAA, is a major concern for healthcare providers, VanKirk notes, which is why Key Source products also offer biometric integration and multi-factor authentication, amongst other tools, to ensure patient information is kept private and confidential.

"Few surfaces are handled with as little thought about harmful germs as a computer keyboard," says VanKirk. "Our technologies make this essential tool of the healthcare environment safer to use, more secure, and of maximum benefit to patient care."





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Building a better burger – from plants

WINNER **Impossible Foods**

impossiblefoods.com

Innovation: Plantbased heme molecule for meaty taste

Location: Oakland COO: David Lee

Employees: 50 (Oakland manufacturing

facility) Regional significance:

Reducing global reliance on resource-intensive livestock farming

East Bay favorite:

Riding bikes around Lake Merritt with my daughters

o many Americans, food doesn't get much better than a nice, juicy hamburger. Impossible Foods, on the other hand, is betting that it does.

Founder and scientist Pat Brown came up with the idea for the company's eponymous meat substitute, the Impossible Burger, in 2009 when he realized that to really get people to eat less meat, he needed to create a consumer movement based on delicious and sustainable foods. Just as delicious and more responsibly-produced, the Impossible Burger is remarkably meat-like thanks to the inclusion of a soy-based substitute for heme, the molecule responsible for beef's characteristically "meaty" flavor.

"I'm a meat-eater myself," says COO David Lee, who joined Impossible Foods in 2015. "But from an environmental perspective, we can't continue to responsi-

bly support the growing demand for meat. So Impossible Foods built a burger that answers the question, 'How do we sate the seemingly insatiable global demand for meat?"

Like Lee, many of Impossible Foods' most enthusiastic supports have been meat-eaters looking for a more environmentally-friendly way to deliver that flavor. The burger's restaurant debut came when celebrity and Michelin



Pat Brown, Founder, Impossible Foods

Star-decorated chef David Chang began serving the Impossible Burger at his New York City restaurant Momofuku Nishi in 2016. "The Impossible Burger has taken the opposite of the usual course for a meat alternative burger," Lee notes. "Making our debut in restaurants, rather than grocery stores—and not just any restaurants,

but trendsetting restaurants—Impossible Foods is changing the perception of what

Founder and scientist Pat

Brown's Impossible Burger

for heme, the molecule that

gives beef its meaty flavor.

contains a soy-based substitute

meat alternatives look like." Impossible Foods says the Impossible Burger uses 25% of the water and 5% of the land used to produce a beef burger, and results in emitting just 13% of the amount of greenhouse gases as well. The burger is currently available on the menus of dozens of restaurants around the country, with many more on the way.

Headquartered in Redwood City, the company has around 250 employees and opened a new large-scale facility in Oakland. Once fully at scale, Impossible Foods estimates that the facility, which hires locally, will be able to produce over one million pounds of Impossible Burger per month.

> Left: Producing the **Impossible Burger creates** 13% as much greenhouse gas as a beef burger.

Rethinking the American tofu market

FINALIST Hodo

hodofoods.com

Innovation: Crosscultural culinary collaborations

Location: Oakland CEO: Minh Tsai Employees: 130

Regional significance:

Introducing healthy, delicious, traditional tofu into the American

East Bay favorite: The great and diverse food

sk Americans what they think of tofu, and they'll probably tell you about a tasteless, chalky substance found on sad low-fat or vegetarian menus.

Minh Tsai, founder of Hodo, has a different vision.

The mission to make Americans love tofu began when Tsai was surprised to discover that the tofu sold in U.S. grocery stores bore little resemblance to the fresh tofu he grew up eating in Vietnam. "I remembered tofu as this delicious, really versatile ingredient," Tsai says. "So almost immediately, I decided to learn how to make tofu the proper way."

What started out as a hobby soon became a full-time gig, and in 2004 Tsai left a lucrative position in finance to pursue his dream. Since then, Hodo has blossomed into a sustainable, profitable and growing business. Today, the company's main production facility in Oakland employs more than 100 people.

Hodo's products can be found at more



"Replacing meat is not something we aim to do. In Asia, tofu is not treated as a meat substitute, but as a main protein."

Minh Tsai, Founder, Hodo

than 2,000 grocery stores and on the on tacos and burritos, and as a society we Chipotle locations and chains like Sweet come about anywhere else but here." Greens all the way to Michelin Star restaurants such as Daniel in New York City and The Progress in San Francisco, Tsai says.

Yes, Hodo is the tofu behind the Chipotle sofritas vegan protein. Some might think it odd to combine an historically Asian ingredient like tofu with the spices and marinades associated with Mexican food, but to Tsai the connection was completely natural. "That's what America is all about cross-cultural combinations. It's delicious

menus of more than 3,000 restaurants. get to reap the benefits of tasting new fla-These restaurants include everything from vor combinations that would rarely have

How does Hodo stand out in an increasingly busy space of meat alternatives? "Replacing meat is not something we aim to do," Tsai says. "In Asia, tofu is not treated as a meat substitute, but as a main protein - something that can be had instead or alongside many animal protein dishes. Ultimately, we want to make tofu, this delicious, healthy and versatile ingredient, another delicious and easy option for Americans, too."

INNOVATION AWARDS JUDGES

Carole Ann Bradley

Orton Development

Karen Burns

AMBayArea Daren Chan

AT&T

Katy Christiansen

Lawrence Berkeley National Laboratory

Narsai David

Narsai's Specialty Foods

Vince De Lange

Delta Diablo

Jeff Deiss

Small Business Administration

Patrick Dempsey Lawrence Livermore National Laboratory

Mark Duesler

PG&E Food Service Technology Center

Carl Edwards Pandora

Kenneth Epstein

NewCap Partners, Inc.

Mike Fernald

San Francisco Business Times

James Gardner

AMBayArea

Debrah Giles

East Bay Community Foundation

Chris Glenn

Langan Engineering

Sybil Gurney

Alameda County ITD

Tim Haile

Contra Costa Transportation Authority

Demian Hardman

Contra Costa County

Cindy Hayashi

Caribou Biosciences

Tetyana Kletskova

Cleantech Open

Roberta Klugman Roberta Klugman & Associates

Buck Koonce

Lawrence Livermore National Laboratory

Lee Lambert

Alameda County SBDC

Brian Landes

Transwestern

Mark Martin

California Community Colleges, Advanced

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Biocom

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Institute for STEM Education, CSUEB

Nichelle Rachal

The Clorox Company

Michael Rose Semifreddi's Bakery

Vin Rover

EC2

Gene Russell

Manex **Bianca Sievers**

GO-Biz

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INFORMATION/ COMMUNICATION TECHNOLOGY

Making tiny ultrasonic sensors a reality

WINNER Chirp Microsystems

chirpmicro.com

Innovation: World's smallest, lowest-power ultrasonic time-of-flight sensors

Location: Berkeley CTO: David Horsley

Employees: 15 Regional significance:

Powering a more connected world

East Bay favorite:

Getting a coffee at Caffe Strada and listening to UC Berkeley's Campanile carillon chime

ompact, low-power, and fit for the booming IoT sector, today's ultrasonic sensors are valuable in a variety of applications, from sensing when people enter a room to enabling motion-tracking in virtual and augmented reality systems. But it wasn't always that way.

Ultrasonic sensor technology was stagnant for many decades, explains Chirp Microsystems co-founder and CTO David Horsley. It was around ten years ago, however, that he found a gap in the market.

"Ultrasonic sensors are common in cars - they measure the distance to objects around your car when you're parking. But these sensors are too big and expensive for consumer electronics, so nobody had really looked at trying to use them for applications like smartphones or VR," says Horsley. "We invented a way to make millimeter-sized ultrasonic sensors on silicon wafers, just like integrated circuits."

In 2008, Horsley, who also serves as a full-time professor and director of the MEMS Lab at UC Davis, together with collaborator Professor Bernhard Boser of UC Berkeley, recruited researchers Rich-



Chirp Microsystems founder and CTO David Horsley, left front, and members of the Chirp team.

ard Przybyla and Stefon Shelton to make this technology a reality.

Chirp Microsystems spun out as a private company in 2013, with co-founder and CEO Michelle Kiang joining Horsley, Przybyla, and Shelton. Funded by two micro-VC's and government grants, Chirp joined UC Berkeley's Skydeck accelerator, licensing the technology that the founding team had developed in the lab.

The technology that makes Chirp's 3D sensing solutions possible is MEMS (short for "microelectromechanical systems"), which refers to those microscopic devices with moving parts that have only

been made possible relatively recently, thanks to advancements in semiconductor device fabrication technologies.

The uses for Chirp's technology range from traditional applications like room occupancy sensors to new applications like helping drones and robots to navigate and enabling motion tracking in VR and AR.

In late February, Tokyo-based electronics giant TDK announced its agreement to acquire Chirp Microsystems. Chirp will become a TDK subsidiary, but all of Chirp's employees will stay on and the company will remain in Berkeley.

Transforming pre-hospital emergency care

FINALIST Beyond Lucid Technologies

beyondlucid.com

Innovation: MediView health information exchange platform

Location: Concord **CEO:** Jonathon Feit

Employees: 5

Regional significance:

Saving lives by plugging gaps in the prehospital care environment

East Bay favorite:

It's the gateway to so much that is great about California

ighly regulated, incredibly complicated, and often messy, the emergency medical services (EMS) space tends to attract those with a strong personal connection to the work. Beyond Lucid Technologies (BLT), the Concord-based EMS technology and consulting firm, is

The company is dedicated to the memory of president and co-founder Christian Witt's father and sister, who were killed in an automobile accident in rural New Mexico. That day, Witt explains, the EMTs were

unable to forward any information to the data gaps in the EMS care pipeline. "An and Columbia (South Carolina). hospital or activate a triage team before estimated 50% of critical patient infor- A rare profitable digital health startup, the ambulance arrived.

"The inherent complexity of the EMS field remains a major barrier to entry for new technology firms," says co-founder and CEO Jonathon Feit. "But what helped us persevere was that strong, personal connection we have to the work."

Feit and Witt's research led to the company's MediView platform, a line-up of innovative health information exchange solutions designed to plug persistent



mation is lost at each node of handoff in the prehospital environment," Feit says. "MediView lets EMTs easily capture information in the field and move it in near-real time to the hospital, before the ambulance even arrives."

On the strength of its technology, the company has won top EMS industry innovation awards, and forged collaborations with major government contractors like Lockheed Martin, Telamon,

Jonathan Feit, left, and Christian Witt, co-founders of Beyond **Lucid Technologies**

and Conduent (formerly Xerox Business Services). BLT serves Fire and EMS agencies in over 15 states, including Alameda County EMS and the City of Alameda Fire Department in the Bay Area, and communities around Dallas, Chicago, Denver, Hartford, Stockton, Flagstaff, Bentonville, Cincinnati,

BLT is advancing the next phase of its business: Halcyon, a patent-pending "postcrash intelligence" solution that leverages the MediView architecture to connect vehicles and emergency responders that are en route to the scene. Whereas technologies like OnStar transmit details about what happened to the vehicle during a crash, Halcyon will relay critical health details about the vehicle's occupants to emergency responders before they arrive.

Building youth leaders through community service

Jefferson Awards engage students in projects to make a difference

The goal of the Club

is to instill in other

students and teachers

that they have the

power to change the

world.

BY CELIA XIE, Jefferson Awards Student in Action Club Treasurer, San Leandro High School

n 1972, Jacqueline Kennedy Onassis, U.S Senator Robert Taft, Jr. and Sam Beard founded The Jefferson Awards, the Nobel Prize for public and community service. In 2006, programs were added

to the award recognition component to provide youth with skills that position them as leaders and change makers in their communities.

San Leandro High School's (SLHS) Jefferson Awards Students in Action Club has engaged in community service for over a decade. The students are self-driven leaders set on completing at least two projects a year to benefit their school, their community or society as a whole. The Club has raised thousands of

dollars annually through volunteerism and passion for service. Through their projects, they learn about critical needs and have life changing experiences themselves.

Past projects include their "Castlemont High Run" to benefit homeless and abused students at Oakland's Castlemont High School

(\$5K raised), their "Portable Potties" project to supply the homeless in Oakland with water and portable toilets for one year (\$10K raised) and their "2017 Attack Asthma Run" with their cross country team to educate others about asthma, while raising money for research.

In each of their projects, the Club continuously brings awareness

to issues that matter to them and involves the school to be part of the solution. The goal of the Club is to instill the idea that students and teachers have the power to change the world as they see it.

This year, Club members decided that they wanted to address the problem of homelessness by supporting a local organization that provides rehabilitation and education programs to help victims in the homeless cycle. Whatever their project, Club members demonstrate the impact of public and community

service - what the Jefferson Awards are all about.

Members of the nationally recognized SLHS Jefferson Awards Students in Action Club served as volunteers for the 2018 East Bay Innovation Awards.

For more information, visit studentsinaction.jeffersonawards.org





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Lighting up tumors to treat cancer

WINNER RefleXion Medical

reflexion.com

Innovation: Biologyguided radiotherapy technology

Location: Hayward CEO: Todd Powell

Employees: 90

Regional significance:

New modality in cancer care could positively impact millions of lives around the world

East Bay favorite:

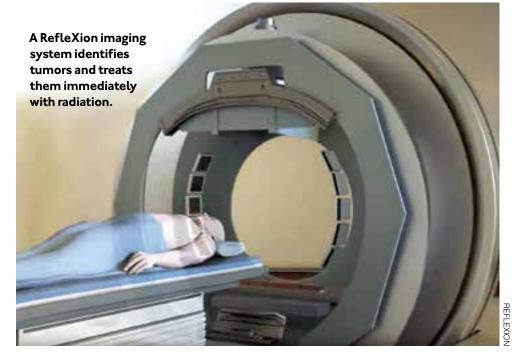
Crossing the bridge knowing that our employees don't have to deal with that heavy traffic

here are few things more devastating than a cancer diagnosis. Even the most treatable forms provoke intense fear and anxiety, and patients want to know that they're getting the best possible care - and the best shot at a long, healthy life. Unfortunately, there are no guarantees.

The good news is that cancer treatment is constantly improving, and one of the most critical areas of development has been the imaging used to plan cancer surgery and radiation therapy procedures. Right now, standard radiation therapy technologies rely on incomplete and stale images at the time of treatment. That's where Hayward-based RefleXion Medical comes into the picture.

"The reality is that everyone has a cancer story," says company CEO Todd Powell. "It's scary – and for good reason. We believe that our approach can make a real difference because our technology sees and targets the cancer directly. In a way, the tumors signal their positions directly to the machine, which creates a much higher degree of precision that can lead to better results with fewer side-effects."

RefleXion Medical's core technology was invented by Dr. Sam Mazin, who was working on his doctorate in medical imaging at Stanford when he conceived of a way to combine the gold-standard in cancer imaging, positron-emission tomography (often referred to as a "PET scan"), with radiation therapy. Mazin's vision was a single integrated system that would identify



"When it comes to treating cancerous tumors, precision and real-time imaging of the disease itself is everything."

Todd Powell, CEO, RefleXion Medical

the most active parts of a tumor and eradicate them immediately with radiation, rather than waiting for minutes to form a full PET scan. "When it comes to treating cancerous tumors, precision and real-time imaging of the disease itself is everything," Powell says.

Powell says, "We think that the East Bay, and Hayward in particular, feels very business-friendly. There is space to grow, and it's centrally-located, which is important for recruitment and also for working with our academic and industry partners. It's a great home for us."

Portable breast cancer diagnostics

FINALIST POC Medical Systems

pocmedical systems.com

Innovation: Pandora CDx Point-of-Care diseasescreening platform

Location: Livermore **CEO:** Sanjeev Saxena

Employees: 50 Regional significance:

Screening vast unscreened populations to combat global cancer

East Bay favorite: The open space, the parks and trails, the schools, the labs and the people

t seems as if there's a new breakthrough in the war on cancer every day, whether it's a new drug to shrink tumors or a new diagnostic tool to catch this devastating disease before it spreads throughout the body. One of the most promising of these new weapons a handheld device to detect breast cancer - was developed by Livermore-based POC Medical Systems. The company is already getting a lot of attention in the oncology community.

"In places like India and China there simply aren't enough labs to effectively test for and diagnose breast cancer, and a lot of women are dying simply because they don't find out they're sick until their disease is at an advanced stage," says POC Medical CEO Sanjeev Saxena. "What we created is a portable device that turns an equipment-heavy six-hour process into a very easy test that delivers results in about 30 minutes."



"In places like India and China, ... a lot of women don't find out they're sick until their disease is at an advanced stage."

Sanjeev Saxena, CEO, POC Medical Systems

Saxena's work is based on research tional Laboratory using blood-based biomarkers for breast cancer detection. His team reduced the scale and complexity of the lab's approach and developed a mobile platform that is as accurate as other leading detection methods - and can be deployed for a cost of about \$10 per patient. POC Medical raised more than \$20 million last year and is gearing up for its initial deployment in India.

"Livermore is really the right home being done at Lawrence Livermore Na- for us," says Saxena. "We have access to great talent here, and because of the reverse commute, we have been able to attract team members from the other side of the Bay. Livermore I-GATE gave us the space we needed when we started, and local investors helped us get the company off the ground. It's important to have the right culture of innovation to launch a company like ours, and Livermore has everything we need to thrive."

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G.M. Associates, inc.
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Aquamenities
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Davis Instruments
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FreeWire Technologies
GRID Alternatives
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Mango Materials
Smart Wires Inc.

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Blue Endeavors
Code Next
Gameheads
Oakland Unified School District,
Computer Science
Paden School - Alameda
PilotCity
Resilient Wellness
Socos Learning
Spotlight Girls
Tech Exchange

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Institute for Creative Integration
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Kiwi Campus
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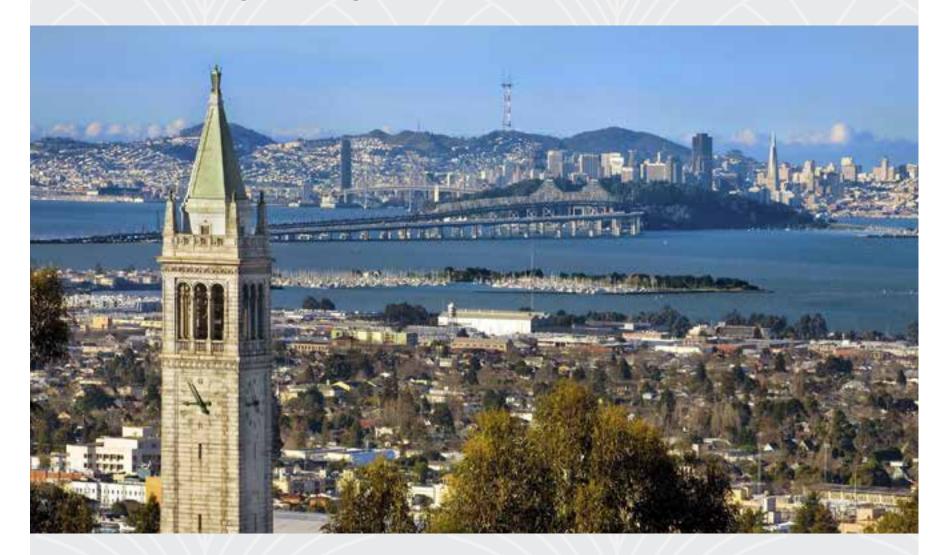
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Thursday, May 17, 2018





Keynote Speaker Chancellor Carol T. Christ University of California, Berkeley

Unveiling of the 2018-19 East Bay Economic Outlook Report With presentation by Beacon Economics

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