About Arrowhead Center at NMSU

Arrowhead Center plays a vital role in economic development: commercializing discoveries and innovations, encouraging entrepreneurship, launching and developing new businesses, and creating lasting partnerships between stakeholders on and off-campus.

Please visit Arrowhead Center at http://arrowheadcenter.nmsu.edu/
Highlights of Accomplishments

13 Businesses in the Arrowhead Technology Incubator

30 Arrowhead students assisting clients with technology commercialization

53 NMSU faculty projects in the commercialization pipeline

60 Small businesses receiving services and assistance

87 Students and alumni in the Studio G business accelerator, with startup businesses progressing

90 Educational workshops hosted by Arrowhead

230 NM middle and high school students who participated in Innoventure programming

$1.2M Amount of federal, state, and private foundation investment in Arrowhead
Thank you for taking the time to read this report, which highlights one of Arrowhead’s most remarkable years to date. From new inventions to new businesses to a growing culture of entrepreneurship, Arrowhead and our partners have had an amazing year as we collaborate on improving the innovation economy at NMSU and beyond.

Arrowhead is NMSU’s primary economic development arm, tasked with ensuring the discoveries developed on campus make their way to larger communities who need them most. But our efforts don’t stop at the boundaries of campus: Arrowhead is working throughout the region, bridging state and international borders to invigorate our economy.

Each of the varied elements that make up Arrowhead boasted great achievements this year, including increased membership in our business incubators, federal support for continued expansion of Arrowhead Park, more domestic and international partnerships, and the accomplishments of our clients.

The year also brought a number of investments that will allow us to continue to grow our programming. The Daniels Fund awarded Arrowhead a substantial grant to expand our “cradle-to-career” youth entrepreneurship programming, ensuring that young people from kindergarten through university will have the chance to explore and practice entrepreneurship. The NMSU Foundation stepped up as the anchor investor in a $2,000,000 fund that will support commercialization of NMSU-developed technologies. These, along with other investments noted throughout this report, provide critical resources necessary to widen Arrowhead’s reach and scope.

As you read, I challenge you to think about ways that you can become involved in Arrowhead’s mission. We continually seek new partners interested in contributing to an innovative, sustainable economy. We hope you will join us in our efforts.

Kathryn R. Hansen
Arrowhead Center would like to thank its network of partners: NMSU’s administration, faculty, staff, and students; advisors who lend their expertise to our clients and staff members; counterpart organizations and groups that share our goal for a robust regional innovation ecosystem; and our state and congressional leaders.
Technology that could improve orientation control for spacecraft is the latest commercialization project to receive seed funding through Arrowhead’s Launch program.

The adaptive singularity-free control moment gyroscope technology was developed by Amit Sanyal, an assistant professor of mechanical and aerospace engineering at NMSU, along with doctoral candidate Sasi Prabhakaran. Engineering master’s student Taylor Burgett, a client of Arrowhead’s Studio G, is working to commercialize the technology for use in cube satellites.

Control moment gyroscopes are internal momentum-exchange devices that are used to control the orientation of a rigid body in space, from nano-spacecraft to crafts as large as the International Space Station.

The technology has additional applications beyond spacecraft, including rockets, cars, robots, ships and even health care, Burgett said.

“The main selling point of this technology is that it provides affordable, low-power and high-control-authority orientation control for spacecraft, particularly nano- and micro-satellites that have mass, size and power constraints,” Sanyal said. “Currently, we are prototyping a three-unit ASCMG cluster where each unit will be the world’s smallest control moment gyroscope.”

Launch helps transition early-stage research projects into marketable products by exploring a technology’s commercial potential very early in development and providing funding and resources for that work.

Jason Koenig, Arrowhead’s director of entrepreneurship and commercialization, who oversees Launch, said the program has a new format in this, its fourth year, awarding work space and $5,000 in kick-off funding to each of six finalist projects, which then received four months of intensive development and mentorship to assess and validate technologies, explore customer development and identify investment opportunities. The six projects then competed for the opportunity to win seed funding of up to $25,000.

Koenig said this year’s competition was the largest yet, and all participants worked very hard to develop their technologies in a short timeframe. They presented their technologies at an April demonstration day for the judges, followed by a reception to celebrate the work that each team had done.

“Our judges all commented on how outstanding all of the projects were and how much they enjoyed learning about them,” Koenig said.

He said the judges selected the gyroscope technology because Sanyal, Prabhakaran and Burgett demonstrated great awareness of the market niche and an excellent strategy to successfully get there.

Launch is supported by the U.S. Economic Development Administration’s i6 Challenge program, which seeks to support commercialization of the nation’s most promising emerging ideas and technologies.

For more information about Launch, visit http://arrowheadcenter.nmsu.edu/launch. For more information about the adaptive singularity-free control moment gyroscope technology, email ascmg.info@gmail.com.
Projects developed through Launch have led to three issued patents, five patents pending, one faculty-led startup, four student-led startups, two technology licenses to student-led startups, one license to an external company, and one license in negotiation.
WE'RE CONSISTENTLY IMPRESSED WITH THE IDEAS NEW MEXICO’S STUDENTS ARE GENERATING.”

– MARIE BORCHERT, EDUCATION SPECIALIST AT ARROWHEAD
Middle- and high-school students from across New Mexico showed what they’d learned about “upcycling” at the 12th annual Innoventure student competition, hosted by Arrowhead Center on May 1, 2015 at the Corbett Center Student Union on the NMSU campus.

Roughly 125 students competed in the event. The teams of two to five students each began working on their projects last fall with a $50 budget and a directive to solve everyday problems using science, technology, engineering and math to upcycle products that would normally be thrown away into a new, marketable product.

“We’re consistently impressed with the ideas New Mexico’s students are generating,” said Marie Borchert, Education Specialist at Arrowhead. “It’s always amazing to see the culmination of months of work that has gone into their projects.”

Borchert said the Innoventure competition is a window to the future of invention and entrepreneurship in New Mexico.

First place winners at the middle- and high-school level received a touch-screen laptop. Additionally, students who won in the high school category received a $350 scholarship to NMSU. Borchert said previous winners have taken advantage of that scholarship to enroll at NMSU and continue exploring their ideas with support of Arrowhead Center’s Studio G student business accelerator.

Innoventure is supported by Arrowhead and grants from AT&T, the MS Doss Foundation and Wells Fargo. The event is also sponsored by the Marriott Springhill Suites and FirstLight Federal Credit Union.

“These sponsors have really helped us make this program something students return to year after year,” Borchert said. “We’re able to reach more and more students in New Mexico thanks to their support.”

WINNERS INCLUDED:

OVERALL WINNERS MIDDLE SCHOOL
First Place:  Deming Recycling, Red Mountain Middle School
Second Place: Reusinators, Home School Team
Third Place: Oven Busters, Crownpoint Middle School

BEST IN... WINNERS MIDDLE SCHOOL
Oral Presentation: GoCi, John Paul Taylor Academy
Marketing: RetroRecyclers, Home School Team
Business Model Canvas: Knights of Light, Anton Chico Middle School
Prototype: Headbanditz, Anton Chico Middle School

OVERALL WINNERS HIGH SCHOOL
First Place: JBT, Goddard High School
Second Place: MADD Prequels, Goddard High School
Third Place: Desert Innovators, Goddard High School

BEST IN... WINNERS HIGH SCHOOL
Oral Presentation: Wonder Wheels, West Las Vegas High School
Marketing: ProTerraNova, Ruidoso High School
Business Model Canvas: NIT Industries, Portales High School
Prototype: Austere, Goddard High School

Students ‘Upcycle’ Trash into Treasure at NMSU’s Innoventure Competition
(Amanda Bradford, University Communications)
A new NMSU technology could revolutionize carbon dioxide capture and have a significant impact on reducing pollution worldwide. With support from NMSU faculty members Abbas Ghassemi, Reza Foudazi and Jalal Rastegary, chemical engineering doctoral candidate Nasser Khazeni has developed a special material that can capture carbon dioxide with greater capacity than any technology currently in widespread use for that purpose.

Arrowhead is working to protect and commercialize the technology. Technology licensing associate Terry Lombard helped Khazeni obtain a provisional patent for the technology. “This technology is going to radically impact the world with regard to carbon dioxide released into the atmosphere,” Lombard said. “It’s exciting.”

According to the U.S. Department of Energy, the U.S. generated more than 3.18 billion metric tons of carbon dioxide in 2013, of which two thirds was attributed to power plants alone. In general, about 20 to 30 percent of a power plant’s energy is spent on capturing carbon dioxide emissions, at a cost of $70 per metric ton. “It’s expensive and has a negative environmental impact,” Lombard said. “This new technology is a solution to both of those problems.”

Khazeni’s research focuses on solid adsorbents, which capture carbon dioxide and store it for transport or storage. A hybrid metal and organic structure called a zeolitic imidazolate framework (ZIF) adsorbs carbon dioxide molecules to its structure of metal ions and organic linkers.

Through his research, Khazeni has synthesized a new subclass of ZIF that incorporates a ring carbonyl group in its organic structure, giving it a vastly greater affinity and selectivity for separating and adsorbing carbon dioxide and a more chemically and thermally stable structure. “This technology is very scalable and the market is ready for it,” Lombard said. “It’s going to change the world, with regard to carbon dioxide capture.”
EMISSION STANDARDS ARE BEING IMPOSED BY GOVERNMENTS WORLDWIDE, BUT THERE IS NOT AN EXISTING PRODUCT TO MEET REQUIRED NEEDS. ZIF’S OUTSTANDING CAPABILITY FOR CO2 CAPTURE PROVIDES A REVOLUTIONARY SOLUTION.

—TERRY LOMBARD, TECHNOLOGY LICENSING ASSOCIATE.
Studio G has continued its trends for growth and success. Launched in 2011 with an initial cohort of four business teams, Studio G is currently home to 50 businesses under development by 87 student entrepreneurs. Studio G has helped over 170 student entrepreneurs in the last two years. Studio G has helped these students raise $1,500,000 in investment, grants, and contracts over that same time period.

This year, Studio G piloted the Air Force Research Laboratory’s (AFRL) Young Entrepreneur Program, which helps students commercialize technologies that align with AFRL research areas. The program includes a $50,000 award supporting Studio G member Taylor Burgett and his company Revolv Technologies as he works to commercialize a gyroscope technology developed by Dr. Amit Sanyal (NMSU, Mechanical Engineering). Revolv Technologies also won $30,000 as the 2015 Launch competition winner. “AFRL’s Young Entrepreneur Program is a tremendous opportunity for our students to work with a top-notch research lab,” Studio G Director Dr. Kramer Winingham said. “I’m excited to see what they will be able to accomplish. I believe we have all the pieces in place to succeed.”

Two Studio G teams also received $50,000 National Science Foundation Innovation Corps (I-Corps) Team awards this spring. The I-Corps Team program identifies NSF-funded researchers who, with additional assistance, can advance commercially-promising technologies toward the market and third-party investment. Assistance is delivered to entrepreneurial students and mentors who work with the researcher in a team format.

Studio G member Dakota Burrow, Dr. Ou Ma (Mechanical Engineering), and Winingham won the first I-Corps award this spring and traveled to New Jersey to find commercial opportunities for a Gravity Offloading Machine developed at NMSU. For the second award, Studio G member Brian Patterson, Dr. Roy Xu (Mechanical Engineering), and Winingham traveled to Virginia to investigate the commercial potential of Dr. Xu’s novel material system, which has the capability to produce lightweight, low-cost shields and impact resistant products.

![ANNUAL REPORT 2014 | 2015](image-url)
ATI enjoyed a number of programmatic and client successes in FY 2015. The incubator is currently home to 13 client-businesses in a range of industries, including clean energy, water management, sustainable agriculture and food production, antenna technology, Electronic Healthcare Records management and more.

Startup Weekend Las Cruces. The incubator hosted the second annual Startup Weekend Las Cruces in October, bringing together potential entrepreneurs, expert mentors, and judges for a 54-hour experience in developing an innovative idea into a model for a new business. The event drew 67 attendees. A Startup Weekend winner, TimerGlove – a device used to improve exercise efficiency – became a Studio G client and eventually a Launch competition finalist.

NMSU alum and cofounder of online giant Etsy, Jared Tarbell, was the event’s featured speaker. A New Mexico native, Tarbell received a Bachelor of Science degree in computer science from NMSU and co-founded Etsy, an online marketplace to buy and sell handmade goods, in 2005. Located in New York, Etsy was named one of the most valuable startups in 2013 by Business Insider. Tarbell also opened a high-tech toy factory earlier this month in Albuquerque called Levitated, which manufactures intricate structures from paper and wood.

OneEighty

(Amanda Bradford, University Communications)

A startup company launched at ATI is taking its show on the road, bringing its text message-based concert ticketing and broadcast alert concept to one of the nation’s top music scenes – Austin, Texas. OneEighty got its start in the ATI in 2013 as a no-charge membership club that gave NMSU students, staff and members of the Las Cruces community instant access to deeply discounted offers from local merchants through text messages.

With help from the industry experts they were introduced to in the incubator environment, Swope and Forrest were able to test their model and learn what works – and what doesn’t. The duo worked with Arrowhead to pivot the company’s focus, using the text-messaging distribution system they’d developed to sell event tickets in a more convenient way, with OneEighty’s Tickets2Text feature.

Zetdi Sloan, director of Arrowhead Technology Incubator, said OneEighty’s incubator graduation is a testament to its maturity as a company. It now has a strong foundation, built on rigorous customer development in Las Cruces, she said, which will allow it to enter the market it was built to Business Insider.
for. “They’re moving out, but we expect them to visit for Thanksgiving,” Sloan joked. “We’re really proud of what they’ve accomplished and wish them all the best in Austin.”

“Our experience at Arrowhead was really exemplary of what an incubator should do,” Forrest said. “We wouldn’t have gotten through that learning curve if we hadn’t been there.”

New Mexico Shrimp Co.

ATI welcomed a new client business in FY 2015: New Mexico Shrimp Co. Addressing the need for sustainable, environmentally-friendly models for seafood production, the company is using strategies developed at NMSU to produce local, farm raised shrimp. New Mexico Shrimp Co. provides locally sourced shrimp that reduces over-fishing of the oceans and the need for preservatives required for long distance shipping.

Tracey Carrillo, assistant director of NMSU farm operations, is leading the project. Carrillo noted that while the company is currently supplying products to Albuquerque-based Ragin’ Shrimp, which has a license with NMSU, they are pursuing promising leads to establish relationships with partners in Las Cruces and elsewhere. A new facility in Mesquite, NM, which is nearly complete, will increase its capacity with 12 shrimp production pools.
In the past year, NMSU has introduced new technologies and products in areas as wide-ranging as dyes that will help identify and treat cancer, organic pesticides, voice authentication security software, and shrimp that can be grown in the desert.

The common thread between these innovative ideas is the need for funding to get them off the ground and into the market. To help address this gap, NMSU and Arrowhead Center have created the Arrowhead Innovation Fund, previously known as the Arrowhead Innovation Fund, with an anchor investment of up to $500,000 committed by the NMSU Foundation.

“This is a game-changer for NMSU and the inventors and researchers who work here,” said Kathy Hansen, Arrowhead’s director and CEO. “It’s critical investment in the future of innovation and entrepreneurship.”

She said the fund will provide the early-stage capital that is crucial to getting great ideas off campus and into the hands of people who will benefit from them.

The Arrowhead Innovation Fund has a goal to raise $2 million. Once the fund reaches $750,000, the Foundation will match with the first $250,000 contribution, and then continue to match 25 percent of every dollar raised, up to an additional $250,000, to reach that goal.

Bobby Lutz, who chairs the Foundation’s investment committee, said support on the committee for this anchor investment was unanimous.

“Supporting entrepreneurship is an important goal in NMSU’s strategic plan for economic development,” Lutz said. “The investment committee sees this as a multi-faceted investment that could provide significant economic returns to the Foundation. It’s an investment in the school’s infrastructure, and a recruiting and retention tool for both students and faculty.”

The fund will support NMSU’s most commercially promising new technologies — those identified by Arrowhead as likely to have a significant market impact in a relatively short time with some capital and business development support.

Work like this has been going on since 2012 through Arrowhead’s Launch proof of concept program, which identifies inventions and research products likely to make marketable products and provides cash awards and services to realize the projects’ potential.

“Launch has demonstrated that this model works,” Hansen said. “However, the funds we had to invest were extremely limited. The Arrowhead Innovation Fund will allow us to truly test the wings of what the NMSU community is creating.”

The fund will be advised by El Paso-based venture capitalist and Arrowhead Investor-in-Residence Beto Pallares, a Kauffman Fellow with a network of more than 100 venture funds. His work with Arrowhead has made Pallares extremely familiar with NMSU’s research and technology commercialization landscape.

“Rarely is one afforded an opportunity to witness the evolution of an idea from concept and intellectual property development to acceleration and pre-commercialization,” Pallares said. “My years with Arrowhead and my involvement in groups like NMSU’s...
Intellectual Property Advisory Committee have let me see firsthand the cutting-edge work NMSU researchers are producing – the ideas are there, and we’ll now have the funds we need to move them further along in their commercial paths.”

Pallares said he’s confident the NMSU Foundation’s anchor investment will allow the fund to attract additional supporters, with an ultimate goal of $2 million available for investment.

NMSU President Garrey Carruthers – long a champion of investing in university inventors and innovations – praised the fund as a way to help position the university and Arrowhead as regional leaders in technology commercialization.

“Other universities in the region have been trying out these sorts of programs and funds, and we wanted to ensure we stay at the head of the pack,” Carruthers said. “NMSU’s researchers have stepped up with ideas that will change their fields, and we’ve stepped up to make sure they have the support they need to do so.”

Creation of this kind of fund to support innovation was one goal identified by Arrowhead when it competed for and won a $2 million Economic Development Administration i6 Challenge grant, which has also funded the expansion of the Launch proof of concept center and the creation and development of the Arrowhead Innovation Network, a group of expert advisers that supports Launch.

“The i6 Challenge grant has made a huge difference in our ability to move NMSU innovation to the market,” Hansen said. “This latest milestone of creating the Arrowhead Innovation Fund will fill a critical capital investment gap.”
NEW MEXICO STATE UNIVERSITY IS A CARING COMMUNITY, AND THAT COMMUNITY EXTENDS WELL BEYOND OUR CAMPUS.

—NMSU PRESIDENT GARREY CARRUTHERS
NMSU recently joined an esteemed cohort of U.S. colleges and universities noted for their focus on collaboration with the larger communities in which they reside. With its Carnegie Foundation Community Engagement Classification, NMSU became one of just 361 campuses in the nation with this designation, which distinguishes institutions for their capacity to connect their knowledge and resources with those of off-campus partners for the mutual benefit of all.

President Carruthers notes that “New Mexico State University is a caring community, and that community extends well beyond our campus. We’re conducting research with significant real-world impact, providing training opportunities to everyone from working ranchers to newly elected government officials, and partnering with our public schools, the health care industry, our Native American population, entrepreneurs and many others.”

VPED team member Kristin Morehead added, “Community engagement is inherent to the land-grant mission, and going through this self-study process gave us a broader understanding of institutional efforts conducted across every college, unit, and division on campus.”

The classification is leading to additional planning and work as the VPED team and partners on campus are exploring ways to better capture data and share stories about the incredible community engagement efforts at the university. Additionally, the team is in the process of applying for other awards and designations that will continue to distinguish NMSU as a leading force in university-community collaboration.

Additionally, NMSU has been designated an Innovation and Economic Prosperity University by the Association of Public and Land-grant Universities (APLU) and its Commission on Innovation, Competitiveness and Economic Prosperity. The designation acknowledges universities working with public and private sector partners in their states and regions to support economic development through a variety of activities, including innovation and entrepreneurship, technology transfer, talent and workforce development, and community development.

“This is exciting news,” NMSU President Garrey Carruthers said. “This designation recognizes NMSU’s contributions to economic development across the state and our work in creating the next generation of entrepreneurs for New Mexico.”

Eighteen universities received the designation in 2015, after conducting a thorough self-review with outside stakeholder input and subsequently submitting an application that went through a rigorous independent review process. Part of NMSU’s role as an IEP University will include providing mentorship to other university economic engagement leaders and participating in a community of learners that will share experiences during the designation’s 10-year period.

The APLU is the nation’s oldest higher education association, representing 238 public research universities, land-grant institutions, state university systems, and related organizations. For more information and a complete list of APLU Innovation and Economic Prosperity Universities, visit www.aplu.org.
A pioneering partnership that began last year between Arrowhead Center, Mexico City’s local government and several universities there is bringing innovative commercialization methods to participants.

Arrowhead Center, New Mexico State University’s economic development engine, was invited to help implement the unique, three-phase program, which is called “Atrevete a Emprender,” or “Dare to Be an Entrepreneur.”

The partnership included the Social Development Fund FONDESO, part of Mexico City’s local government, and five universities: Universidad Autonoma de Mexico, Instituto Politecnico Nacional, Universidad Autonoma Metropolitana, Tecnologico Nacional de Mexico and Universidad Autonoma de la Ciudad de Mexico.

Arrowhead served as the host for the first phase of the program, incorporating a business model program for participating teams composed of students, recent graduates, researchers and faculty members. To participate in the program, teams needed two to four participants with at least one student currently enrolled in one of the participating institutions.

In the second phase, Arrowhead will help participants improve business performance and will use hands-on training for staff members from each of the five institutions.

In the final phase of the program, Arrowhead will assist in creating seed funding for entrepreneurs in Mexico City to incentivize the creation of high-impact startups.
Running Lean Masterclass held at Arrowhead Center
Gerardo Martinez exemplifies the exceptional students working with Arrowhead, both as student employees and through our Studio G student and alumni business accelerator. Gerardo’s multidisciplinary approach and entrepreneurial spirit have led to impressive achievements.

Gerardo graduated with his Master’s degree from NMSU in Mechanical Engineering in 2014, and has plans to earn a second M.S., an MBA, and a Ph.D., which he hopes will lead to an opportunity to perform research at the International Space Station. “My interest, even as a child, has always been in making, fixing, and improving things...my ultimate career goal is to own my own business and eventually become a university professor to teach a future generation of engineering students,” he noted.

Gerardo is the first in his family to graduate from high school, and defines himself as a “curious, motivated, hardworking, disciplined, and proficient engineer and entrepreneur.” He joined Studio G to grow his company, Multiple Enginuity, focusing on the entertainment, aerospace, and alternative energy sectors, although his initial focus is solely on the entertainment industry.

The company’s current products include a virtual reality obstacle course at White Sands National Monument and projection mapping services for event promotion in downtown Las Cruces. Gerardo is currently seeking funding through grants and crowd-funding platforms. Gerardo also competed in NMSU’s version of the popular TV show “Shark Tank” in May.

We wish Gerardo luck as he starts his engineering career at Sandia National Laboratories while continuing to pursue his entrepreneurial dreams.
Students employed by Arrowhead in FY 2015 are currently working with NASA, Los Alamos National Laboratory, Sandia National Laboratory, Sun Mountain Capital (Santa Fe, NM), and StartFast Venture Accelerator (Syracuse, NY).
Dr. Rolston St. Hilaire is a professor and Assistant Department Head in the Plant and Environmental Sciences Department at New Mexico State University, where he teaches courses in landscape horticulture and environmental stress physiology. He is currently a co-project director on a USDA-NIFA-funded project that is investigating whether succulent plants indigenous to the high desert regions of the Navajo Nation could contribute to food and energy sustainability.

Dr. St. Hilaire and his research team have been working to develop a hardy, drought resistant variant of the Bigtooth Maple tree, which they named Acer grandidentatum ‘JFS-NuMex 3.’ His success led to his research being published in the journal In Vitro Plant and has led to a partnership with J. Frank Schmidt, an Oregon-based wholesale nursery. Working with Arrowhead, Dr. St. Hilaire has developed license agreements that will allow the nursery to commercialize the tree. He anticipates releasing the new cultivar to the public in early 2017.

Arrowhead Center is excited for Dr. St. Hilaire as he continues to create plants that thrive in New Mexico and the United States. We look forward to working with Dr. St. Hilaire in the future.
“I HAVE BEEN EXTREMELY PLEASED WITH THE GUIDANCE AND SUPPORT I RECEIVED FROM ARROWHEAD IN DEVELOPING THE LICENSE AGREEMENTS AND THE SUBSEQUENT FILING OF A PLANT PATENT FOR ACER GRANDIDENTATUM ‘JFS-NUMEX 3.’”

– DR. ROLSTON ST. HILAIRE

JFS-NuMex 3 leaves turn Aggie Crimson in autumn.
GOOD ENGINEERING SCIENCE LEADS TO GOOD TECHNOLOGY.

– DR. AMIT SANYAL

Variable Speed Control Moment Gyroscope (VSCMG): Dr. Amit Sanyal (NMSU, Mechanical & Aerospace Engineering) developed this technology to provide precise attitude control and stabilization for spacecraft or other applications such as marine vessels, robots, individuals with walking difficulties, and astronauts engaged in space walks. The VSCMG is comprised of novel hardware and software architectures that can be used for changing the orientation (attitude) of vehicles ranging from nano-spacecraft to spacecraft as large as the International Space Station.
Dr. Amit Sanyal, an Assistant Professor in the Mechanical & Aerospace Engineering Department at NMSU, is playing an active role in the commercialization of novel aerospace technology through Arrowhead Center. To Dr. Sanyal, “good engineering science leads to good technology.” He is currently working on the development of a novel gyroscope with primary applications in vehicles ranging in size from nano-spacecraft to the International Space Station, but which could also be used in anything from cars to robots to healthcare.

Dr. Sanyal has opened this work and research to graduate students, mentoring a student team that recently won an Air Force Research Lab (AFRL) Young Entrepreneur Program award, which will provide $50,000 to help the team work on business and marketing aspects of the technology.

Additionally, this same team was the overall winner of Arrowhead’s 2015 Launch proof of concept competition (please see page 26). These awards, Dr. Sanyal noted, bolster the engineering advances represented in his work: “Arrowhead’s Launch and Studio G provide substantial help for technology-related business development, which in turn can have great returns on the investment.”

Arrowhead Center looks forward to a continuing relationship with Dr. Sanyal, and congratulates him on his promotion to Associate Professor at NMSU.
Engaging with the regional business community is a top priority for Arrowhead, and one on which we focused extensively in FY 2015.

“Our area business people are some of our greatest assets,” Arrowhead Director Kathy Hansen noted. “They have the experience, expertise, and feel for regional markets that are so valuable to Arrowhead clients working on entrepreneurial ventures. We’re always seeking ways to bring these groups together.”

A new means for accomplishing this was suggested by Las Cruces business leader and NMSU supporter Lou Sisbarro (The Sisbarro Dealerships): events based on the popular television series Shark Tank, in which aspiring entrepreneurs present their ideas to a panel of business experts for feedback and potential investment.

In May 2015, Arrowhead held its inaugural Aggie Shark Tank, featuring four “sharks”: Sisbarro, Royal Jones (Mesilla Valley Transportation), Mickey Clute (Gencon Corporation), and Dino Cervantes (Cervantes Enterprises, Inc.) and four new ventures emerging from Arrowhead’s Studio G.

Revolv is a business developing cell phone case insert systems that allow users to carry items such as medication, cosmetics, and small tools with them. Woodie Grips is marketing innovative wooden golf putter grips designed to enhance feel for more accurate putting. EcoSeal is working to commercialize an organic pesticide developed in an NMSU laboratory to support environmentally-friendly agriculture. Multiple Ingenuity is an independent research and design company currently developing innovative equipment for projection mapping.

“Aggie Shark Tanks are a great way to showcase the range of innovative ideas and products emerging in the NMSU community,” said Jason Koenig, Arrowhead’s Director of Commercialization and Entrepreneurship. “Interacting with experienced local entrepreneurs sets our clients on a path for solid preparation for future deals.”

“In addition to the chance to receive investment in their ventures, participants were able to get feedback and advice from some of the region’s brightest business minds,” Hansen added. “We were very pleased with the pilot event.”

Additional Aggie Shark Tanks are planned for August 2015 and as part of NMSU’s 2015 Homecoming festivities in October.
A new $100,000 federal grant will help Arrowhead Center build greater participation in two federal programs that fund collaborative efforts between researchers and small companies working to take new technologies to market.

Arrowhead Center was one of just 20 universities and organizations nationwide to receive the grant this year from the U.S. Small Business Assistance Federal and State Technology, or FAST, Partnership Program. FAST improves participation of small businesses in federal Small Business Innovation Research and Small Business Technology Transfer programs for innovative, technology-driven small businesses.

“The first step in creating a successful partnership is initial matchmaking,” said Kathy Hansen, Arrowhead Center’s director. “We’ll be hosting events with partners around the state to bring together researchers and entrepreneurs who can collaborate through SBIR/STTR activities.”

The SBA, the Department of Defense and the National Science Foundation jointly reviewed the grant proposals, which were submitted through each of their state and territorial governors. Each governor was able to submit only one proposal.

“New Mexico higher education institutions, including NMSU, continue to demonstrate their ability to contribute to tech commercialization and getting products to market,” N.M. Gov. Susana Martinez said. “This was a highly competitive grant, and I am proud of the effort that went into securing this assistance to help our small businesses.”

Under the one-year grant, Arrowhead will also develop a comprehensive web-based presence for the program, Hansen said, and will provide participants with assistance in writing SBIR/STTR proposals, with input from NMSU faculty members who have served as reviewers of such proposals.

Paul Furth, an associate professor in electrical and computer engineering, serves as an Arrowhead Enterprise Advisor specializing in SBIR/STTR programming. He has helped spearhead efforts to apply for more awards, providing workshops and one-on-one mentoring to clients, and will have a lead role in FAST programming.

“SBIR/STTRs are the federal government’s way to do angel investing in small U.S. businesses,” Furth said. “They’re great programs.”

The programs are administered by the SBA in collaboration with 11 federal agencies, which collectively supported more than $2.5 billion in federal research and development funding in fiscal year 2014. Companies supported by the SBIR and STTR programs often generate some of the most important breakthroughs each year in the U.S. For example, about 25 percent of R&D Magazine’s Top 100 Innovations come from SBIR-funded small businesses.

“FAST provides boots on the ground support at local levels to help entrepreneurs...
“compete and win SBIR/STTR awards,” said John Williams, SBA’s Director of Innovation. “These programs are the largest source of non-diluted early stage funding in the world, attributing to the success of tens of thousands of firms since being established in 1982. Yet many entrepreneurs in cities and states across the country are unaware. The main goal of FAST is to increase that awareness through partnering organizations and level the playing field, especially in underrepresented areas.”

Reaching those underserved communities around the state is an important part of Arrowhead Center’s role in regional economic development, Hansen said.

“The FAST award will help Arrowhead fulfill one of the foundational elements of our mission: ensuring the resources of NMSU help people throughout New Mexico,” she said. “By bringing assistance with SBIRs and STTRs to entrepreneurial thinkers and businesses who may not have been aware of these opportunities, we foresee great things for individual participants and for the state economy at-large.”
A half-million dollar grant from the Daniels Fund will help New Mexico State University’s Arrowhead Center develop a “cradle-to-career” pipeline for young people throughout New Mexico to practice innovation and entrepreneurship at every stage of their education, emphasizing critical thinking and problem-solving skills.

The Daniels Fund provides grants to nonprofit organizations in Colorado, New Mexico, Utah, and Wyoming in a variety of areas, including ethics, education and youth development. This two-year, $500,000 grant will ultimately support the statewide expansion of programs within Arrowhead Center that engage students beginning in elementary school and continuing through college.

“This grant will allow us to make great strides in expanding our programming throughout the state,” said Arrowhead Center Director and CEO Kathy Hansen. “We’ll place a special emphasis on areas with little or no history of participation.”

To maximize the effectiveness of that expansion, Hansen said her team will gather information from internal staff and current partners about the current programming’s strengths – and where improvements can be made.

“We will also look at the programming’s long-term impact on post-secondary school enrollment and employment,” Hansen added. She said NMSU’s Cooperative Extension service will be integral to the statewide expansion, as they assist with understanding specific needs in those communities.

Arrowhead’s cradle-to-career pipeline begins with Innoventure Jr., which provides backpacks with age-appropriate materials on basic work and business concepts in both English and Spanish to elementary students. The program is currently available in 10 schools in Las Cruces, Deming, Albuquerque and Gallup, but will be expanded throughout the state, introducing the concept of entrepreneurship to the youngest students. Camp Innoventure engages middle school students in a weeklong summer camp format to develop a simple product, create a marketing plan and sell their products to actual customers.

More than 2,000 middle and high school students in New Mexico have also participated in Innoventure, a program that lasts an entire academic year, in which they work in teams to develop a product and business plan they present to judges from the business community. The process culminates in an annual competition at which teams present to panels comprised of NMSU and private industry representatives. Teams are judged on technical, business and presentation components.

“Innoventure can also be seen as a pipeline to NMSU,” said Education Specialist Marie Borchert, who oversees the program. “High school winners earn scholarships as part of their award packages, and several Innoventure alumni are currently enrolled at NMSU, where they have access to the Studio G student business accelerator to further explore those ideas, and several have done so.”
Studio G, created in 2011, is the first business accelerator in the state dedicated to college students and recent graduates. The accelerator has led to the creation of 31 registered businesses, several of which are generating revenue for their founders, and is currently supporting 47 teams in various stages of developing their ideas.

“The Daniels Fund award will help us expand the reach of Studio G to help more Aggies start businesses,” said Kramer Winingham, Studio G’s program manager. “The Studio G program has grown substantially over the last two years, and we’ve had strong demand for our services from student entrepreneurs. I’m excited to see what we will be able to accomplish with this generous support.”

NMSU President Garrey Carruthers said the grant will help drive economic development in New Mexico by building on the university’s strong relationship with K-12 schools throughout the state.

“We’re reaching the students who will eventually become the business leaders of our state,” he said. “We want these future Aggies to have the best possible foundation right from the start, so they’re equipped to discover the innovations of tomorrow.”

Grants from the Daniels Fund, established by late cable industry leader Bill Daniels, also support the Daniels Fund Ethics Initiative at NMSU, which recently received a second $1.25 million award to continue the program launched in 2010, as well as an online ethics training program for state employees in New Mexico and licensing of the Innoventure program for use beyond the state.
Arrowhead Center at New Mexico State University aims to help identify and meet New Mexico’s health care delivery and technology development needs through a new grant from the U.S. Economic Development Administration.

NMSU’s economic development hub will receive $488,000 in grant funding to create a master development plan for Arrowhead Park that includes a health care technology cluster to better support startup companies focused on improving health care in the region and diversify the state’s economy.

The funding comes from the EDA’s Regional Innovation Strategies Program Science and Research Park Development Grant, which helps regions plan the creation or expansion of innovation centers. Arrowhead Park, a public-private land development partnership, offers space, facilities and services for technology-based businesses and connects entrepreneurs to researchers.

The health technology cluster plan will incorporate market analysis of the needs of this key sector in the region and guidelines for master-planned development of Arrowhead Park to meet identified demands.

“This award will have a significant impact on our work to create a sense of place for innovation in our region,” said Kathy Hansen, director of Arrowhead Center. “With this funding, we will be able to greatly expand our capacity to bring a single hub together with the talent and ventures that drive an innovation economy.”

Wayne Savage, executive director of Arrowhead Park, said the grant will provide the foundation for much-needed job growth and workforce development in the health care and medical technology industry sectors.

“Our goal,” Savage said, “is to develop Arrowhead Park as an innovation community that catalyzes a more effective, efficient health care delivery model for New Mexico and the region, and improved health overall for our underserved populations.”

In announcing the grant award, U.S. Assistant Secretary of Commerce for Economic Development Jay Williams said
“The Regional Innovation Strategies Program lays the groundwork from which centers of research and innovation can take root and thrive in cities across the country,” Williams said. “I look forward to seeing what innovative opportunities come from Regional Innovation Strategies’ funding.”

An agency within the U.S. Department of Commerce, the EDA makes investments in economically distressed communities in order to create jobs for U.S. workers, promote American innovation, and accelerate long-term sustainable economic growth.

Arrowhead Center has also received grants through the EDA’s University Center for Economic Development Program, to identify gaps in the regional commercialization ecosystem and create programs that increase statewide participation in commercialization efforts, and the i6 Challenge, a national competition to spur innovation, accelerate commercialization of ideas to market, and create companies and jobs through support of proof of concept centers.

For more information about the Regional Innovation Strategies Program, including a full list of the 2014 grant recipients, please visit: http://www.eda.gov/oie/2014-risp-competition.htm.
The work Arrowhead is undertaking requires help from partners from all backgrounds and sectors. There are a number of opportunities to collaborate with us as we build a sustainable innovation economy:

- Offer your expertise and experience to our clients as a mentor or Enterprise Advisor
- Give a workshop, training session, or share your personal experiences in the business world
- License an NMSU-developed technology to start a business
- Explore opportunities in sponsored research for your company

Additionally, Arrowhead’s successes are fueled by our donors: those who see the value in our programs and provide financial and in-kind resources to help us move forward.

For more information, please contact Kathy Hansen at hansen@nmsu.edu or by phone at 575-646-4220.

Sponsorship Opportunities

Student Internships

Host a student intern at your business. Invite a student to intern at your successful business, where they can contribute and gain valuable experience.

Student Startup Fund

Support Aggies creating new businesses: $100 and up. Arrowhead Center is working with students pursuing business ventures in a range of fields and markets. Your support ensures vital resources for new companies.

Outstanding Student Entrepreneur Award

Support an NMSU student who has demonstrated exceptional entrepreneurial ambition and skills: $1,000 per award. Selected students will receive support to further their entrepreneurial education, experiences, or ventures.

Sponsor Studio G Networking Hour

Provide coffee and snacks for Studio G’s weekly networking hour for one year: $3,000. Networking Hours brings student entrepreneurs together each week at Arrowhead’s Studio G Student Business Accelerator, where participants receive educational talks and opportunities to meet with peers and others in the innovation community.

Help a Student or Recent Alum Start a Business

Sponsor a student to work for one year on turning their idea into a business: $5,000. Sponsored students and recent alums will receive coaching and mentorship to develop their idea or technology into a business or to expand an existing business.
Our Mission

At Arrowhead, we commercialize technology and help small businesses at all stages start and grow through our services, resources, connections, and expertise.

We are committed to economic development in our region and have established our services to help researchers, start-ups, and entrepreneurs pioneer new technologies, businesses, and partnerships.

As part of NMSU, we value working with students and provide them with client-based learning opportunities to accelerate their knowledge of economic development and tools that will make them responsive to the growing demands of the business world.