

# The Mars Leap- SBIR/STTR Project Pitch V5- 8/10/22 pg 1/4

## 1. The Technology Innovation. (Up to 500 words)

Describe the technical innovation that would be the focus of a Phase I project, including a brief discussion of the origins of the innovation as well as explanation as to why it meets the program's mandate to focus on supporting [research and development \(R&D\)](#) of unproven, high-impact innovations.

### Technology Innovation- (500 Words)

Apollo rode to space on the dreams of a world, but Blue Origin made the world doubt space exploration altogether. Why? One went 'for all mankind' while the other unabashedly went for those who can afford it. 'Average people' dream less today because they don't think space is for them anymore. But if 'average people' could experience the final frontier... just a little... what would the dreams be like then?

We plan to innovate the hardest-to-reach part of the technological world, human beings, by reaching dreams themselves. The Mars Leap is a travelling, interactive, immersive, science exhibit based on Mars Direct mission architecture. Visitors train and travel to Mars to join a team scouting Martian colony sites. They'll learn the science and real-world value of space exploration through proven educational techniques, amplified by specially developed technology and the overwhelming power of first-hand experience. They'll leave knowing THEY can have a future in space. But The Mars Leap doesn't just shape these dreams, it provides new tools to make them real.

Immersion experiences, currently reserved for theme parks and gaming, offer unheard-of possibilities for open-ended, collaborative, inspirational education. Dramatic environments and tangible hardware combined with new networking systems and presentation technologies can customize experiences for age and ability. They would also increase educational impact and subject retention, provide targeted information for casual visitors and in-depth explorers alike, be updatable with current scientific developments, increase the outreach and impact of current museums, and more.

The Mars Leap revolves around Mars, but all the techniques, programs, and technologies developed would apply to future exhibits on almost anything. The immersive, open-ended approach would enable previously impossible connections between museums, visitors, schools, and businesses.

Schools, churches, scouts, or science clubs in a museum's display area would form teams to compete by planning their own Mars missions. They'd enact them using The Mars Leap as a simulator, be scored on their results, and multiple winners would receive scholarships. Competitions and scholarships are both unprecedented in the museum world, but they would expand traditional museum audiences and offer powerful tools to leverage scarce marketing resources.

New tools like networked exhibits, where displays in one place are controlled from another, would allow new collaborations between museums. Small facilities (where budget or size prohibit The Mars Leap) could join a central museum displaying the core exhibits. The reciprocal outreach of this region-wide exhibit would benefit all involved, seeding future partnerships as well.

Space technology is the central educational content, giving space companies a new tool to energize hundreds of thousands of space enthusiasts here on Earth. Beyond that, through scholarships and integrated career outreach, they'll have a unique new way to reach the next generation of STEM professionals... before they graduate.

In 1969, the Exploratorium's interactive exhibit revolutionized museums. Their philosophy was "Tell me, I'll forget. Show me, I may remember. Involve me, and I'll understand." Immersive exhibitry will revolutionize involvement again for even deeper understanding, inspiring the knowledge, tools, and spirit to make a real Mars Leap possible.

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### 2. The Technical Objectives and Challenges. (Up to 500 words)

Describe the R&D or technical work to be done in a Phase I project, including a discussion of how and why the proposed work will help prove that the product or service is technically feasible and/or significantly reduce technical risk. Discuss how, ultimately, this work could contribute to making the new product, service, or process commercially viable and impactful. This section should also convey that the proposed work meets the definition of R&D, rather than straightforward engineering or incremental product development tasks.

#### Technical Objectives and Challenges (*391 words*)

The goal of The Mars Leap is to inspire visitors with dreams of space and give them tools to make the dreams real. The distinct technical objective is to develop new educational techniques around immersive, interactive simulation experiences. An 'immersive' experience is anything that surrounds the user with an environment, from virtual reality systems to real 3D scenic pieces with props. 'Interactive' experiences require exhibits to change in response to input from users. 'Simulation' speaks to the use of a storyline or scenario to frame the experience, and 'educational' separates the objective from pure entertainment.

The first challenge would be documenting the underlying assumption that immersive exhibitry represents a more effective educational technology than other techniques. There is strong anecdotal evidence, but little formal research correlating learner involvement with increased learning capability.

Creating interactive exhibits for science museums means teaching complex scientific principles using indestructible devices understandable by middle schoolers. It's a technical challenge every time on every subject, but The Mars Leap will break new ground. It proposes to explore concepts and technologies drawn from every aspect of a Mars Direct mission for an expanded range of ages and abilities. This means ideas as complex as orbital mechanics and industrial chemistry, technologies as specific as nuclear-thermal power generation or subsurface water mapping, and questions as vague as the ethics of human spaceflight or the value of terraforming another planet, all made accessible for anyone. The Mars Leap will absolutely push the bounds of the possible in science museums... the technical challenge is how far.

Technical challenges could arise in proposed new museum-museum, museum-business, and business-visitor connections. Museums don't traditionally work together, and institutional competitiveness or the simple logistics of scheduling could prevent regional coordination we propose. We envision an outreach system that connects museums with local businesses, but businesses might not find this attractive, or museums might not have the resources to enact it. We see this as a way for businesses to create and connect with new STEM graduates, but the connection could fail on either end.

A nuts-and-bolts technical challenge would begin with the specialized AV and computer systems required. The collaborative, problem-solving experience we envision will require individualized computer and AV control with heavily networked visitor access points. The flexibility and power of the computer system will ultimately determine how open-ended and adaptable the experience can be.

**3. The Market Opportunity. (Up to 250 words)**

Describe the customer profile and pain point(s) that will be the near-term commercial focus related to this technical project.

**250 Words on Market Opportunity (249 words)**

In some ways the museum industry is a niche market. It's small compared to many other industries, and science museums are a subset competing against new educational and entertainment opportunities. Overall museum attendance has declined, though interactive museums remain strongest. The industry could revitalize their audience and increase their educational value through immersive techniques, but few museums can combine cutting-edge technology with presentation techniques, and few exhibit companies have the specialized educational experience museums require. The Mars Leap offers a way to bridge this gap in an industry small enough for its significant innovations to make outsized impacts.

In other ways the museum market is huge, contributing \$12 billion to taxes and \$50 billion [to the economy each year](#). The [Association of Science and Technology Centers](#), representing 487 science centers and museums in 47 countries, estimated 70 million US visits and 120 million worldwide (2016 statistics). Nationally and internationally, science centers are popular, respected, and integral parts of their communities. According to the [American Association of Museums](#), Americans trust museums over local papers, nonprofit researchers, the government, or academic researchers, and 96% of Americans across the political spectrum approve of lawmakers who act to support museums.

Additional markets are also realistic. The 325-350 [air shows](#) in North America attract 10-12 million people per year. 116,000 struggling [US malls](#) need attractions, as do thousands of technical job fairs nationwide... for starters. The museum industry is the first target for The Mars Leap, but it's only the beginning of what's possible.

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### 4. The Company and Team. (Up to 250 words)

Describe the background and current status of the applicant small business, including key team members who will lead the technical and/or commercial efforts discussed in this Project Pitch.

#### 250 Words on Company & Team (248 words)

IXITID Concepts was formed to create a new generation of immersive, interactive, educational museum exhibits. The Mars Leap will be first, a showcase for more to follow. The project depends on subcontractors in fields from computers to educational development. IXITID will coordinate as design lead, and our core team brings unique abilities to promote success.

Charles Letherwood has over 30 years' experience in design, fabrication, and marketing, specializing in the interactive museum design critical to this project. He's designed museum and tradeshow exhibits, medical and consumer products, stage scenery, educational installations, and much more. His teaching experience spans disabled populations, college seminars, and at-risk youth. He brings years of marketing experience including radio, web, print, and networking. Charles' passion for space exploration and proven ability turning blue-sky thinking into tangible reality makes him ideal to lead this project.

Rick Gales' decades in museum sales, development, and marketing give him unparalleled knowledge of this arcane field. Don Merrill's years in non-profit development prepare him to forge connections between museums and businesses. Jerry Oakes' experience in technology development and commercialization includes products in every industry, including work with NASA back to Apollo.

Dr. Robert Zubrin is a pivotal part of The Mars Leap. As the engineer who originated the Mars Direct mission architecture itself, he offers a matchless opportunity for first-person content insight.

As a primary purpose of The Mars Leap is connecting industry to people, we expect to attract many more science, engineering, and technology specialists to our team.