

# FIRST NATIONS

## ENTERPRISE DEVELOPMENT FUND

*A Small Business Investment Company in Formation*

### Capital Financing

Defense Industry Subcontracting and Components  
Manufacturing Joint Ventures

Investment Template / Program Architecture:



**Sovereign Advisers**<sup>®</sup>  
Specialists in Risk Metrics Analytics

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### INFORMATION SUMMARY

Kevin O'Brien  
Chief Investment Officer



It is my honor and privilege to introduce an exciting development which offers the potential to significantly alter the paradigm for economic development of American Indian Nations. Over the past sixteen months and with the invaluable assistance of numerous individuals, an experienced management team has been assembled to create the First Nations Enterprise Development Fund. This innovative program is slated to become the first federally chartered Small Business Investment Company ("SBIC" or "the Fund") focused exclusively on financing the development of manufacturing joint ventures on, or in close proximity to, Indian reservations and designated HUBZones. As such, this program will become a national demonstration project for financing economic development on American Indian reservations.

The underlying rationale for the Fund's investment strategy is the creation of a business model with which to access the federal incentive programs available to eligible firms, thereby providing the Fund's portfolio companies with a decisive competitive advantage relative to non-reservation competitors, as well as to provide investors in the program with a 39% federal investment tax credit and access to 3:1 federal supplemental funds.

The management team recruited to operate this program has received a successful review of the Fund's investment strategy and program metrics from the Investment Committee of the U.S. Small Business Administration in Washington, D.C. Capital commitments may be subscribed by qualified parties including corporate investors, regulated financial institutions, casino operators, tribal nations, and other classes of eligible institutional investors. Advantages to SBIC participants include the following:

- Yield enhancement provided by access to 3:1 federal supplemental funds (i.e., the ability for the Fund's investors to earn a return on \$20 million of invested capital for each \$5 million in committed investor capital). The premium yield feature effectively doubles the investors' internal rate of return.
- The Fund's investment strategy has been designed to qualify for the recently enacted new markets tax credit program, enabling participants to receive a 39% federal investment tax credit on the entire amount of their commitment. This tax credit may be allocable among multiple classes of investors.
- The reservation manufacturing joint venture business model offers SBIC participants the ability to monetize substantial federal preference programs (e.g., \$6 billion in annual HUBZone set-asides, 20% cumulative bid price premium incentive, and the 5% Department of Defense incentive subsidy program).
- SBIC participation is an eligible CRA compliance activity for participating financial institutions.

Advantages (continued)

- Participation in an SBIC enables corporations, regulated financial institutions, and tribal investors to engage in private equity and mezzanine investments (e.g., equity; convertible debt; or debt with warrants) through the formation of component manufacturing and technology commercialization joint ventures with premier research & development firms and prime defense contractors, thereby capturing the value accretion increment. Besides partnering with established premier R&D companies, an SBIC may acquire a controlling interest in portfolio investments, providing additional assurance of value protection for investors.
- Designation of each participating financial institution as a First Nations Preferred Depository Institution<sup>™</sup> providing select institutions with a highly visible vehicle for attracting tribal gaming deposits, currently estimated at \$8 billion per annum.
- Availability of a corporate sponsorship (i.e., private label) opportunity for a select corporate investor to brand the program as a corporate social imperative.

## Investment Strategy



## Commercialization of Defense Sector R&D: Component Manufacturing Joint Ventures

The First Nations SBIC investment template comprises the joint venture business model. This business model is especially tailored to technology-based manufacturing and subcontracting activities, including OEM component manufacturing and assembly operations. The joint venture model offers numerous benefits and has proven successful in applications involving Alaskan Native Corporations ("ANCs"), enabling numerous ANCs to develop exceptionally profitable business enterprises and achieve sustainable, diversified economies. Prospective joint venture participants will include select R&D firms, and are expected to comprise predominantly SBIR stage III federal grant awardees, as the U.S. government's SBIR program historically represents an excellent proxy for determination of commercialization success. Joint ventures will generally entail either licensing or direct contribution of proprietary technology. In order to validate the Fund's investment model, the First Nations management team has successfully developed the first advanced-technology manufacturing company ever created on an American Indian reservation; Advanced Ceramics Manufacturing LLC, a joint venture company established in partnership with Advanced Ceramics Research ("ACR") to commercialize certain products and processes which are proprietary to ACR.



## Investment Model: Advanced Ceramics Manufacturing

Joint Venture: Advanced Ceramics Research / Tohono O’Odham Nation

Advanced Ceramics Research (“ACR”) is recognized by numerous federal defense agencies as a top-ranked defense contractor, and is an R&D 100 award-winning company located in Tucson, Arizona. The company has also received the White House Tibbett’s award for outstanding business practices. The Fund management team worked with the principals of ACR to establish a joint venture company, [Advanced Ceramics Manufacturing](#), to commercialize ACR’s R&D technologies as a component manufacturer under subcontract to major defense companies and under direct contract to U.S. defense agencies. In order to ensure competent governance of the joint venture company, we invited Dr. John Buckingham, Dean of the Eller Graduate School of Management at the University of Arizona, to become a member of the board of directors for the company, along with Mr. Charles (“Gus”) Grant, founder and Chairman of Sprint Corporation. Both director nominees accepted the invitation, and Dr. Buckingham subsequently received approval from the Arizona Board of Regents to serve as a member of the board of directors of the company. This transaction was the topic of a story developed by Mr. Dan Morse, a Washington, D.C. bureau reporter for the Wall Street Journal, and was approved by the WSJ editorial staff as a front page feature article. Subsequent to formation, the joint venture company was purchased by the San Xavier Development Authority, a tribally-chartered organization of the Tohono O’Odham Nation, where it continues profitable manufacturing operations today on the Tohono O’Odham reservation near Tucson, Arizona.

Subsequent to successful validation of the Fund’s investment model, the First Nations SBIC program has been developed to expand and capture the business opportunities available to astute participants, including providing participants with a premium yield attributable to utilization of 3:1 federal supplemental funds and a 39% investment tax credit. In addition, the ability of the First Nations SBIC program to provide capital financing for reservation enterprise development means that tribal gaming revenue need no longer compete with funding for the development of other types of enterprises. The Fund’s investment strategy offers financial participants access to strategic partners, enabling participants to partner with outstanding defense contractors and premier technology development firms. Through the formation of manufacturing joint ventures with strategic partners, the SBIC program offers participants the ability to acquire a portfolio of financial interests in manufacturing and commercialization affiliates on an actual cost basis valuation. Since gaming is approaching market saturation in many areas, economic diversification from gaming dependency offers immeasurable long-term benefits to tribal governments and their community members. The SBIC will act as an effective interface between tribal governments and the development and management of enterprise operations, offering separation of financial and business decisions from the tribal political process, thereby providing tribal nations with a diversified, sustainable economy as a foundation for economic self-determination, including development of 21<sup>st</sup> century technology business parks and high wage employment opportunities for tribal members.



### CONTACT

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# SBIC Model Transaction

## Profile of an Economic Development Investment in Advanced Ceramics Manufacturing LLC

A 51% Native American Tribally-Owned  
Delaware Limited Liability Corporation

### Technology Manufacturing Joint Venture

Corporate Joint Venture Partner	Joint Venture Company	Form of Investment
<p><input type="checkbox"/> <b>Advanced Ceramics Research Inc.</b></p> <ul style="list-style-type: none"> <li>▶ Company is an "Inc. 500" Leading Edge Advanced Materials R&amp;D Firm Specializing in Defense Technologies Having Significant Commercial Applications</li> <li>▶ Company is a Recipient of Numerous Awards for Outstanding Technological Innovation</li> </ul> <p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>▶ R&amp;D 100 Award [1999 and 2001]</li> <li>▶ White House Tibbett's Award</li> <li>▶ U.S. Navy Top Ten Defense Contractor</li> </ul> <ul style="list-style-type: none"> <li>▶ Company has Ten Years of Cumulative R&amp;D Investment Resulting in Proprietary Technologies with Exponential Commercialization Revenue Potential</li> <li>▶ Top-Ranked U.S. Defense Contractor</li> </ul> <p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>▶ NASA</li> <li>▶ Ballistic Missile Defense Organization</li> <li>▶ DARPA</li> <li>▶ Navy Space Warfare Center</li> <li>▶ Army Space &amp; Missile Defense Command</li> </ul>	<p><input type="checkbox"/> <b>Advanced Ceramics Manufacturing LLC</b></p> <ul style="list-style-type: none"> <li>▶ Hot Isostatic Pressing of Advanced Ceramics Materials Products Having Significant Commercial and Defense Applications</li> </ul> <p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>▶ Alon® Transparent Ceramic Armor [Raytheon]</li> <li>▶ F-15 Engine Flameholders [General Electric]</li> <li>▶ F-15 Engine Flap and Seal Assembly [General Electric]</li> <li>▶ Missile Control Fins [Raytheon]</li> </ul> <ul style="list-style-type: none"> <li>▶ Laser Cutting of Advanced Ceramics Materials Products</li> </ul> <p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>▶ Green Parts Machining</li> <li>▶ Cutting of Finished Parts</li> <li>▶ Contract Laser Cutting Work</li> </ul> <ul style="list-style-type: none"> <li>▶ High Margin Industry with Significant Barriers to Entry and Availability of Significant Federal Incentives to Companies Employing Native Americans or Located on Indian Reservations or Which are Majority Tribally-Owned (Directly / Indirectly)</li> </ul>	<p><input type="checkbox"/> <b>Direct Equity Investment</b></p> <ul style="list-style-type: none"> <li>▶ In Form of a 51% LLC Membership Interest</li> </ul> <p><u>Use of Proceeds:</u></p> <ul style="list-style-type: none"> <li>▶ Capital Equipment Purchase</li> <li>▶ Operating Capital Loan with Preference Return</li> </ul> <p><input type="checkbox"/> <b>Tribal Build to Suit Industrial Facility</b></p> <p><input type="checkbox"/> <b>Exclusive Manufacturing Arrangement with Advanced Ceramics Research</b></p> <p><input type="checkbox"/> <b>Independent Board of Managers</b></p> <ul style="list-style-type: none"> <li>▶ Member Representatives and Outside Directors</li> </ul> <p><input type="checkbox"/> <b>Exit Options</b></p> <ul style="list-style-type: none"> <li>▶ Sale to Corporate Partner</li> <li>▶ Sale to Strategic Buyer</li> <li>▶ Public Sale (IPO)</li> <li>▶ Cashflow Earnout</li> </ul>
<b>HUBZone Incentive Program</b>	<b>Indian Owned Subcontractor Subsidy Program</b>	<b>Section 8(a) Preference Program</b>
<ul style="list-style-type: none"> <li>▶ \$6 Billion Annual Set-Aside Contracts</li> <li>▶ 10% Bid Price Adjustment</li> <li>▶ Possible 25% ITC for Fund Investment</li> <li>▶ Employment Wage Tax Credit</li> </ul>	<ul style="list-style-type: none"> <li>▶ 5% Department of Defense Incentive Payments to Prime Defense Contractors Utilizing Indian Owned Subcontractors</li> </ul>	<ul style="list-style-type: none"> <li>▶ Federal Contract Set-Asides</li> <li>▶ 10% Bid Price Adjustment</li> <li>▶ \$10 Billion Annual Contracts Awarded to Eligible Firms</li> </ul>

Illustration of an  
**SBIC Model Transaction**  
 Formation of a 51% / 49% Joint Venture  
**Advanced Ceramics Manufacturing LLC**  
 A First Nations SBIC HUBZone Company

**Financial Partner**  
**First Nations SBIC**  
 Corporate / Bank  
 Investment Partnership  
 with access to 3:1 Federal  
 Supplemental Funds

**Representative Directors**  
 2 Persons

- Contribution**
- M&E Capital
  - Operating Loan

**Value**  
 \$2 Million

**Percentage  
 Ownership**  
 51%

**Joint Venture  
 Manufacturing  
 Company**

**Outside Directors**  
 3 Persons

- Outside Directors'  
 Contribution**
- Corporate Governance
  - Industry Contacts

**Facility**  
 Venture to Lease  
 Industrial Building on  
 Reservation

**Strategic Partner**  
 Advanced Ceramics Research  
 Nationally Recognized  
 Technology R&D Firm

**Representative Directors**  
 2 Persons

- Contribution**
- Technological Processes
  - Engineering Capability
  - Production Contracts
  - Management Expertise
  - Access to Markets

**Value**  
 \$2 Million

**Percentage  
 Ownership**  
 49%

Important Policy Decisions Require  
 Supermajority Vote

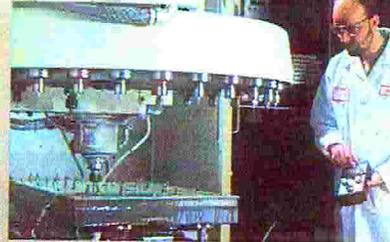
**Advanced Ceramics  
 Manufacturing LLC**

# COMPANY OVERVIEW

Drawing on scientific talent and research expertise from the University of Arizona, and the growing technology base of Tucson, Advanced Ceramics research, Inc. was founded in 1989 to develop state-of-the-art high temperature, high strength ceramic materials and processes.

Although we have evolved from a strictly R&D firm into a manufacturer of products and equipment for many high-tech industries, our mission to improve the performance of ceramics and composite materials while maintaining an intense focus on client satisfaction still remains.

We are committed to a thorough understanding of our clients' needs, and will strive to provide Advanced Ceramics Research, Inc.'s customers with the highest quality products possible and the fastest turnaround in this competitive industry.



Please visit our website:  
[www.acrtucson.com](http://www.acrtucson.com)

ADVANCED CERAMICS RESEARCH  
3292 East Hemisphere Loop  
Tucson, Arizona 85706 - 5013  
TEL: 520 / 573 - 6300  
FAX: 520 / 573 - 2057  
EMAIL: [info@acrtucson.com](mailto:info@acrtucson.com)

# MATERIALS TECHNOLOGY

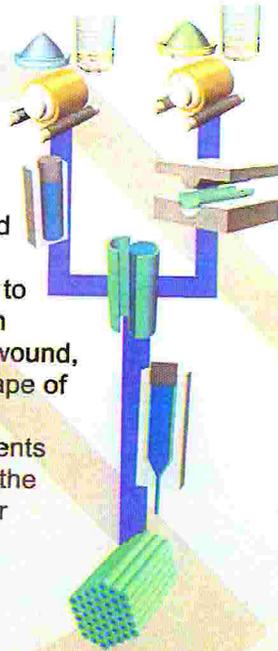
## ACR RESEARCH AND DEVELOPMENT

### MATERIALS AND PROCESSES

Fibrous monoliths are an exciting new class of structural ceramics that exhibit mechanical properties similar to Continuous Fiber Ceramic Composites (CFCCs), including very high fracture energies, damage tolerance and graceful failure.

FMs are produced using a process in which sets of inexpensive, thermodynamically compatible ceramic and/or metal powders are blended with thermoplastic polymer binders and then co-extruded to form a 'green' fiber. The green composite fiber may then be wound, woven or braided into the shape of the desired component.

The fabricated green components are then pyrolyzed to remove the polymer binder and sintered or hot-pressed to obtain the final FM product.



DOE is now initiating a new mining program lead by ACR, Inc. teamed with Argonne National Laboratories, University of California-Santa Barbara, Phelps-Dodge, Inco Mines, Smith Bits and others. This new program focuses on developing low cost carbide fibrous monolith composites for use in a wide variety of wear surface applications.



### APPLICATIONS AND BENEFITS

Fibrous monoliths have widespread applications as structural ceramics including solid hot gas containment tubes, radiant burner tubes and panels, rocket nozzles, body armor plates, automotive engine components and steering vanes for vectored thrust control. All of these components can be readily fabricated from the green materials using the process described above.

DARPA and DOE previously funded ACR, Inc. on a program that developed fibrous monolithic materials for use in the petroleum and gas drilling industry. This work led to the fabrication of low-cost, high fracture tolerance FM cutting tools that will improve the drilling efficiency of rock bits in aggressive wear environments.

### TEAM MEMBERS

Advanced Ceramics Research Inc.  
Argonne National Laboratories  
Cyprus Mines  
Inco Mines Research Ltd.  
Krebs Engineers  
Smith Tool  
The University of California-Santa Barbara  
The University of Missouri-Rolla



advanced  
**ceramics**  
research

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# GOVERNMENT CUSTOMERS

- DARPA



- Navy



- BMDO



- Army



- Airforce



- NASA



- DOE



- NSF



# ALON<sup>®</sup>

## TRANSPARENT CERAMIC ARMOR

### Commercialization Potential

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Advanced Ceramics Manufacturing, LLC is currently negotiating the acquisition of ALON<sup>®</sup> (Aluminum Oxynitride), which is a material technology developed by Raytheon Corporation. ALON<sup>®</sup> is a transparent ceramic used in infrared sensor windows, armor applications requiring lightweight transparent armor, and as a low cost replacement for sapphire applications. Recently, Raytheon transferred the ALON<sup>®</sup> intellectual property rights to ALON<sup>®</sup> Materials Technology Inc., a wholly owned Raytheon subsidiary corporation. ALON<sup>®</sup> Materials Technology Inc. is an intellectual property holding company with no tangible assets.

The ALON<sup>®</sup> product material is bullet proof and allows for light transmission from the visible range into the mid-infrared frequencies. These properties make ALON<sup>®</sup> ideal for use in both defense and commercial applications such as:

- Airborne weapons systems and aircraft components.
- Unmanned aerial reconnaissance aircraft and missile sensor windows.
- Ground vehicle armored windows.
- Laser windows used in supermarket checkout systems.
- Sapphire applications utilized in the semiconductor processing industry.

These applications are characterized by both high volume potential and high margin profitability. Manufacture of ALON<sup>®</sup> products requires use of the hot isostatic press manufacturing process ("HIPing"). Neither Raytheon Corporation nor ALON<sup>®</sup> Materials Inc. own a hot isostatic press ("HIP"). To become fully dense and transparent, ALON<sup>®</sup> must be processed at temperatures approaching 2,000°C. At present, there are only two HIP's in the United States which are capable of consolidating large ALON<sup>®</sup> pieces. Kyocera Corporation operates a HIP manufactured by Kobelco, a division of Kobe Steel Corporation of Japan. This HIP has a fourteen-inch diameter chamber, which precludes the manufacture of any products larger than fourteen inches in width. This is the HIP presently being utilized on a merchant HIPing basis by Raytheon Corporation for the manufacture of ALON<sup>®</sup> products.

The other U.S. HIP is owned by Bodycote IMT, and has an eighteen-inch diameter chamber. Bodycote IMT is the leading merchant HIP service company in the world today, with four facilities in the US and 9 facilities in Europe (see attached list of HIP units operated by Bodycote IMT in the US). Bodycote's large high-temperature HIP in London, OH, has not worked properly since it was delivered and installed by a European manufacturer, over one year ago. The HIP owned by Bodycote IMT continues to experience thermal control problems, and destroyed a prototype during an ALON<sup>®</sup> production attempt, resulting in a "melted blob" of ALON<sup>®</sup>. ACM believes that Kobelco has the high temperature control technology required to economically produce ALON<sup>®</sup>. ACM has opened discussions with Kobelco regarding acquisition of a high temperature HIP, larger than the Kyocera unit but with similar high temperature controls.

Kyocera Corporation provides merchant HIPing as an ancillary service, as a means of mitigating the cost of HIP downtime, and there is therefore some question regarding the continued availability of the Kyocera HIP for ALON<sup>®</sup> production. In any event, the chamber dimensions of this HIP preclude the manufacture of ALON<sup>®</sup> for larger and potentially more lucrative applications. Additionally, Raytheon and the US Government have expressed concerns over revealing too much ALON<sup>®</sup> information to Kyocera since it is a Japanese owned company. The US Government wants to limit the export of this material technology due to the potential military applications.

Production of the ALON<sup>®</sup> transparent ceramic armor product potentially represents the largest segment of ACM's business plan. An estimate of the ALON<sup>®</sup> market potential is provided in the table below for various specified categories.

### Estimated ALON<sup>®</sup> Market Potential by Selected Applications

Application	Estimated Demand	Estimated Revenue	Estimated Gross Margin
UAV Sensor Portals	50,000 Square Inches per Year	\$2,000,000 @ \$40.00 per Square Inch Sales Price	\$1,862,500 @ \$2.75 per Square Inch Manufacturing Cost
Semiconductor Processing	2,000,000 Square Inches per Year	\$40,000,000 @ \$20.00 per Square Inch Sales Price	\$34,500,000 @ \$2.75 per Square Inch Manufacturing Cost
Aircraft Windows (C-17 is an immediate need)	500,000 Square Inches (40,000 for C-17)	\$3,500,000 @ \$7.00 per Square Inch Sales Price	\$2,125,000 @ \$2.75 per Square Inch Manufacturing Cost
Cash Register Windows	50,000 4" x 7" Windows per Year	\$5,000,000 @ \$100 per 4" x 7" Window Sales Price	\$1,150,000 @ \$2.75 per Square Inch Manufacturing Cost
U.S. Military HUMVEE Vehicles Fleet	60,000 Vehicles at an Average of \$10,000 Each Over Five Year Period	\$600 Million Estimated Revenue for Total Fleet Replacement Over Five Year Period	\$270 Million For Entire Fleet Retrofit @\$2.75 per Square Inch Manufacturing Cost
Commercial Armored Vehicles <sup>1</sup>	20,000,000 Square Inches Estimated Worldwide Market for Flat Armored Glass	\$100 Million Potential Worldwide Market at \$5.00 per Square Inch	\$55 Million If Entire Market is Captured @\$2.75 per Square Inch

<sup>1</sup> The 1998 global commercial armored vehicle fleet is estimated at 12,000 vehicles having an average of 47 square feet of glass area each. The fleet is growing at an estimated 8% per annum.



**Raytheon Corporation has calculated an internal estimate for worldwide sales of the ALON<sup>®</sup> product at \$80 million per year.**

Direct manufacturing costs are estimates assuming the appropriate equipment is available and the scale-up of processes to volume production levels are successful. Manufacturing for this level of sales would require access to at least two large HIPs. An inventory of HIP's does not exist. The estimated lead-time from order placement to delivery and installation of a HIP is approximately one year.

### **Commercial Opportunity**

ACM's business plan is based on creating a core competency for high temperature consolidation of ceramic materials. ALON<sup>®</sup> material technology fits exactly into ACM's core competency. Raytheon has informed ACM that it does not want to retain control over ALON<sup>®</sup> material technology. Recent actions and comments by corporate staff indicate that Raytheon is exploring the sale of intellectual properties in order to raise cash to alleviate Raytheon's debt burden. A quick analysis of Raytheon's books and recent comments by stock analysts support these comments. ACM believes that a cash offering would convince Raytheon to sell off their "non-core" ALON<sup>®</sup> technology. Raytheon may want to participate in future ALON<sup>®</sup> revenues through a retention of a minority share of the company. Based upon discussions with Raytheon representatives, ACM believes that a cash offer of \$5 million for an 80% interest in ALON<sup>®</sup> Materials Technology Inc. will be acceptable to Raytheon. Such a transaction would provide ACM with the exclusive rights to global production and sales of the ALON<sup>®</sup> transparent ceramic material.

# Making the Dream a Reality: Developing 'Cutting Edge' Reservation Business

BY KENNETH E. ROBBINS

**W**IN-WIN STRATEGIES HAVE BEEN THE FOCUS OF A few of my past articles but the Pascua Yaqui Tribe of Arizona has actually taken steps to make their hopes for cutting edge business development on the reservation a reality!

In a first of its kind, the tribe has entered into a joint-venture with an award-winning firm, Advanced Ceramics Research, LLC (ACR), which designs high-technology products that are used in aerospace and defense applications.

The venture company, Advanced Ceramics Manufacturing (ACM), LLC, will provide volume production of high, value-added composite ceramic components and will be housed on the Pascua Yaqui Reservation.

This history-making joint venture between Advanced Ceramics Research, Inc. and the Pascua Yaqui Tribe has led to the creation of a high-tech manufacturing company on the Pascua Yaqui Reservation. The company is environmentally very sound and non-pollutant, which is in keeping with tribal values.

With many tribes exploring different venues to expand and diversify economically, the Pascua Yaqui/ACR partnership serves as a good example of how to take a stagnant depleted economy and turn that into the beginnings of a flourishing economy on the reservation.

Through this joint venture, tribal, federal, state and local businesses will work together and support one another to change the status quo.

"The Pascua Yaqui and ACR joint venture is significant because it brings together willing partners: A noble tribe seeking opportunity and a high-tech corporation. I commend both partners on their daring innovation," says U.S. Congressman Jim Kolbe (R-Ariz.) For private industry, there are many incentives to locate their businesses on reservations including numerous tax incentives, training benefits and a ready work-force.

From the perspective of a federal agency like the Department of Defense, this joint venture makes sense as it creates a cutting edge product that department needs and fits into its programs.

For ACR, this joint venture creates capital to use ACR manufacturing expertise but also expands the ACR market; ACR sells research products to the venture company, who has a market niche unavailable to ACR.

Pascua Yaqui tribal executives and the tribal council are working together to have individually owned businesses and major corporations locate on the reservation. The successful gaming operation, "Casino of the Sun," is the basis for the tribe's financial stability.

This joint venture with a leading technology company will create 300 jobs over the next five years for both tribal and non-tribal community members. The benefits will be mutual for both the city and the

tribe," adds Tulsí Uprety, director of economic and community development for the Pascua Yaqui Tribe.

Though most tribes have goals to increase self-sufficiency, there are models that illustrate the relationship among long-term goals, the process of creating one or more tribal enterprises in a partnership or teaming arrangement, and the role that tribal government policies play.

Research dealing with the maintenance of an environment required for enterprise success suggests a seven-step process for developing business partnerships and teaming arrangements. But before even thinking about the seven-step process, a few tribal business development policies are essential for success, including:

A continuous and supportive tribal leadership;

Obtaining talented, respected, and trusted individuals who persevere in developing the business ideas;

Tribal acceptance and practice to leverage resources; and

A policy of profits first and jobs second.

The seven-step process for developing business partnerships and teaming arrangements includes:



1. Matching tribal goals with venture team and the business opportunity;

2. Searching for external and internal business opportunities and markets;

3. Evaluating all sources of financing and resource inputs of co-venturers;

4. Evaluating the potential feasibility and long-term viability of the venture;

5. Carrying out negotiations, seeking out problems, developing alternatives, setting terms and priorities for implementation, and securing agreements;

6. Structuring the business partnership or teaming arrangement; and

7. Company start-up, operations management, and implementation of growth/market strategies.

The Pascua Yaqui have used this newfound financial resource to build the reservation economy and improve the quality of life for tribal members and the surrounding Tucson community.

"Today we bring an idea to realization that will provide a great opportunity and a healthy beginning for us to enter the year 2000. We have always been a part of the community. Now we are a part of the business community," says Benito Valencia, Chairman of the Pascua Yaqui Tribe of Arizona.

The Pascua Yaqui Tribe is using gaming capital to support the joint venture with ACR as the leader in high technology innovation. Often, American Indian business development comes in at the low end of the curve; typically, as the market is being saturated.

Since ACR is on the leading edge of new technology and experimentation that leads to new uses, this joint venture is similar to gaming because both are entrances into now developing markets. □

*Kenneth E. Robbins is the president of the National Center for American Indian Enterprise Development in Mesa, Ariz. The National Center, offers professional, management, and technical assistance in all areas of business development (<http://www.ncaied.org>)*

# Pascua Yaqui become a Defense contractor

## Ceramics venture seed for Pascua industrial park

By Brenda Norrell  
TODAY STAFF

TUCSON, Ariz. - Pascua Yaqui tribal leaders joined with the defense and aerospace industries to announce a multi-million dollar high-tech joint venture on tribal land.

"We are bringing together two noble and willing partners," Arizona Congressman Jim Kolbe told a gathering of press and businessmen.

The tribe signed a 10-year agreement with Advanced Ceramics Research Inc., a leading Defense Department contractor, to manufacture components for laser processing, F110 engines, missiles and CAT scanners. Oil drilling inserts and mining components also will be produced.

The \$3.5 million venture, majority owned by the tribe, includes a new facility to be built on tribal land within 18 months. Starting with 25 jobs, it is expected to provide 250 within five years.

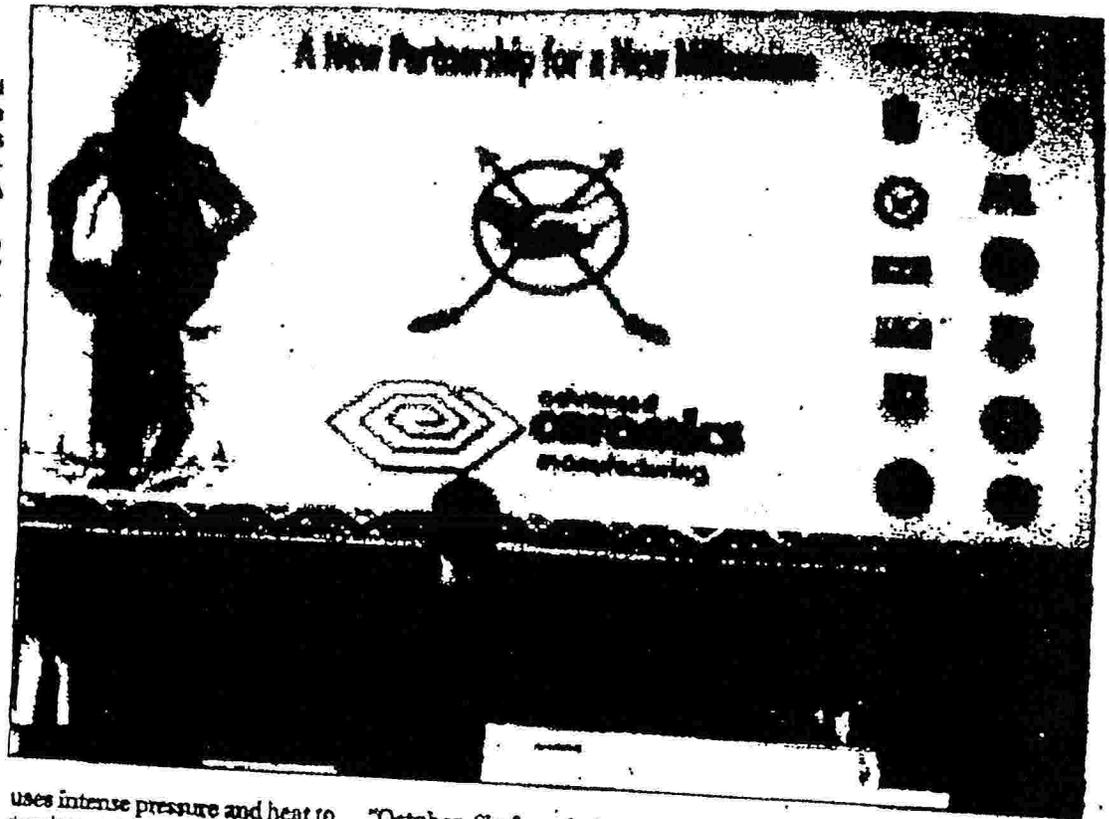
Tribal Chairman Benito Valencia said the tribe, which owns the Casino of the Sun, receives many proposals for joint ventures and this one was carefully considered.

"This caught our eye because it wasn't going to just attract jobs," said Valencia, chairman of the 12,500-member tribe south of Tucson that obtained federal recognition in 1978. Valencia said the industry would offer Yaqui the opportunity to enter the high-tech labor force.

"We are a part of this economy, we are a part of this community, and, as of now, we are a part of this business world. We believe this joint venture will become a model for other Native American tribes."

Tulsi Upreti, tribal economic and community development director, said this "baby step" is the first on an economic journey undertaken with vision and an entrepreneurial spirit.

Working from prototypes, the company's technology includes Hot Isostatic Pressing (HIP) that



uses intense pressure and heat to produce high-strength products of superior integrity. Turbine engine rebuilding is among the applications.

Government sponsors of the company include NASA, Army, Air Force and the Ballistic Missile Defense Organization. Corporate customers include Raytheon Corp. in Tucson, which manufactures a critical defense weapons system, Honeywell, B.E. Goodrich, Thiokol and Boeing.

Anthony C. Mulligan, CEO, Advanced Ceramics Research, said the 10-month effort will generate high-paying jobs and stimulate economic growth on tribal land.

Debra Baber, Hopi tribal member, representing Sen. John McCain, R-Ariz., conveyed his support for tribal economic growth. McCain said the venture would provide new technology at lower costs.

On a personal note, Baber said the venture offers encouragement to Indian youths like her son, who watch the movie,

"October Sky," and want to be rocket scientists.

"Now we can say to young people, Yes, that is a reality. That is something you can do. Go for it!"

**"WE BELIEVE THIS JOINT VENTURE WILL BECOME A MODEL FOR OTHER NATIVE AMERICAN TRIBES," SAID PASCUA YAQUI CHAIRMAN BENITO VALENCIA.**

Rep. Kolbe pointed out that while the economic picture in the United States appears to be healthy, there are pockets in Tucson, and every other city in America, where conditions of poverty are untouched by the nation's economic good-times.

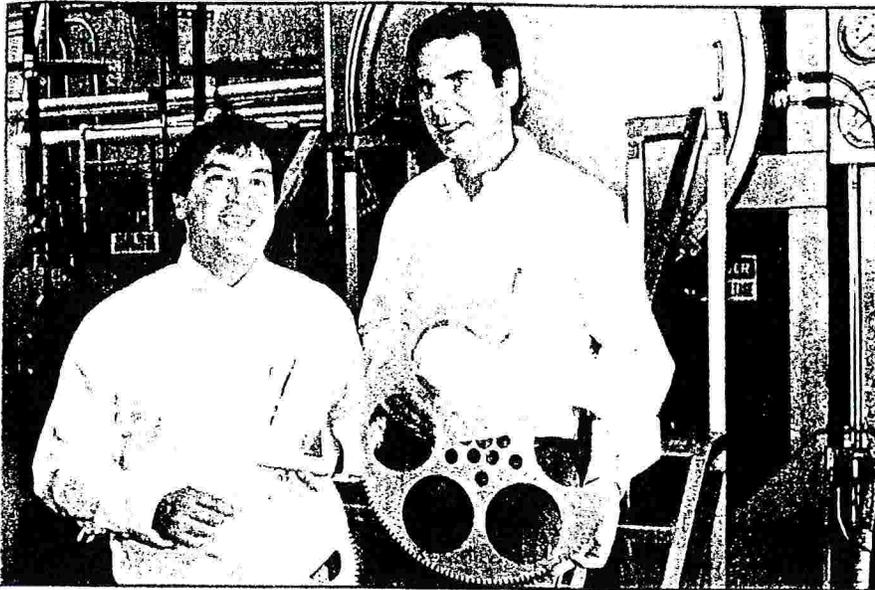
"The people are the backbone of the community," he said.

Praising Advanced Ceramics

for entering into the partnership, Kolbe said businesses are often afraid to take risks. Risks include locating outside of an industrial park and in a neighborhood without a proven track record. "Most follow the safe path."

Until the new facility is constructed on tribal land, Advanced Ceramics Manufacturing Inc. will operate at the facility of Ceramics Research in Tucson International Business Center near the airport.

During the contract signing ceremony 24 people were recognized for contributions to creating the joint venture, including officials from the Office of Naval Research, Defense Advanced Research Project Agency, Raytheon and Dr. John Halloran from the University of Michigan, the Department of Energy, Navajo Surface Warfare Center, U.S. Army Space Missile Defense Technical Center, Wright Patterson Air Force Research Lab, Air Force Research Labs at Edward Air Force Base and NASA Marshall Space Flight Center.



Anthony Mulligan (left) and Mark Angier hold carriers for computer hard drive polishing and stand in front of ACR's hot press, where high-temperature ceramics are developed.

# THE IDEA FACTORY

*Alumni at ACR develop new materials and spin off wide range of commercial products*

Just seven years ago three UA engineering alumni scraped together \$250 each to start a company called Advanced Ceramics Research (ACR).

This year ACR has revenues of \$5 million, has been rated the 11th fastest growing high-tech company in Arizona, and is among the top ten defense contractors in Tucson.

But this remarkable success story isn't really about the new materials, business savvy, or the entrepreneurial aggressiveness that has fueled the company's growth. Instead, it's about ideas.

Walk into ACR's facilities that sprawl through several buildings in a south-side industrial park, and the enthusiasm and creativity driving the company are palpable.

## CREATIVITY AT THE MAX

AME grads Anthony Mulligan, '88, Mark Angier, '89, and Chemical Engineering grad Kevin Stuffle, '85, are like kids who can't wait to show off their newest project or demonstrate the latest techno-toy they've bought to further the company's research. Ideas for new processes, products, and research pour out faster than flood water down a spillway.

As Angier says, "We get to play with all these engineering tools. We're having fun." At the same time, of course, they're

developing valuable new technologies, creating jobs (ACR now has 90 employees), and fueling the economy.

## ACR WINS TIBBETTS AWARD

This has not been lost on the U.S. Small Business Administration, which recently gave ACR a Tibbetts Award, which recognizes small companies that have conducted high quality research under government grants. About 50 award winners were selected this year from around 8,000 eligible companies. Mulligan accepted the award for ACR at a ceremony in the White House in May.

The company originally started in 800 square feet of office space with the intention of conducting materials research under government grants. ACR won the first grant it applied for — and then lost the next 40. "Most people probably would have given up after ten or 20 failures," Mulligan says. "But we just kept going. We wanted to do this. Now we win about one in every four proposals we write."

## RESEARCH FUELS PRODUCTS

Along the way, ACR began commercializing the technologies developed through this research. Most recently the company has been making tremendous strides in high temperature ceramic composite materials systems.

ACR's material systems operate in oxi-

dizing environments above 4,000 degrees Fahrenheit, so they don't require active cooling. The company has been making parts for a wide range of leading edge components for hypersonic vehicles. In addition, ACR has been making rocket test nozzles for a number of groups and recently received an order to build a ceramic solar thermal propulsion engine for NASA. Also being developed are ceramic pressure plates and combustion can components for small turbine engines. These are used for drone and missile applications.

Currently, the company's bread-and-butter products are carriers used in lapping and polishing computer hard drives. ACR sells 35 to 40 percent of the carriers used in computer disk manufacturing.

Among other products are new brake pads for bicycles that grip instantly, even when rims are wet, and better materials for rapid prototyping technologies.

## WATCHING THE DETAILS

But companies don't grow as ACR has based solely on technology. Mulligan, Angier, and Stuffle also are paying a lot of attention to all the details that can make or break a high-tech company.

For instance, ACR has five engineers who work every day and all day just to improve processes and quality control. As a result, the company's hard drive carrier yield is only six or seven rejected parts per 100,000.

When the payroll reached 25, ACR started paying full medical benefits and full vacation. It always has paid more than the minimum wage to entry-level employees on the manufacturing floors.

When Mulligan, Angier, and Stuffle decided to build a permanent home for ACR — to be built on a 2-acre lot — they hired an architectural firm and planned carefully for future expansion. This was more expensive than planning the facility without outside help, but cutting corners to save pennies can cost millions later on, they say.

When the company moves into its new 20,000-square-foot plant, it will install a lot of high-tech equipment. But, most important, it will provide a fertile environment where the innovative engineering ideas from three UA alums and their team can take root.

# First Nations Enterprise Development Fund SBIC

## Reservation Economic Development Investment Program

Component Manufacturing Joint Ventures  
in conjunction with Formation of a Federally Chartered  
Small Business Investment Company (SBIC)

COMPONENT	DESCRIPTION	ADVANTAGES
<p>■ <b>Reservation Economic Development Business Model</b></p>	<p style="text-align: center;"><b>Advanced Technology Commercialization and Subcontract Manufacturing Joint Ventures</b></p> <p style="text-align: center;"><i>In Partnership with</i></p> <ul style="list-style-type: none"> <li>▶ Technology Research Firms</li> <li>▶ Emerging Growth Companies</li> <li>▶ Prime Defense Contractors</li> </ul> <p style="text-align: center;"><u>Examples:</u> Lockheed Martin Motorola TRW</p>	<ul style="list-style-type: none"> <li>▶ Access to Technology, Management and Industry Relationships</li> <li>▶ Value Added Potential</li> <li>▶ Reduced Dependence on Local Economy</li> <li>▶ Provides Tribal Investment Income Through Monetization of Federal Preference Incentives</li> <li>▶ Creates High Wage Manufacturing Jobs</li> <li>▶ Opportunity for University Graduate Employment for Tribal Members</li> <li>▶ Utilized Successfully in Emerging Markets</li> </ul> <p style="text-align: center;"><u>Example:</u> United States - Mexico Border Germany - Poland Border Zone Israel - Jordan Border Zone</p>
<p>■ <b>Reservation Economic and Industrial Development Finance Program</b></p>	<p style="text-align: center;"><b>Federally Chartered Small Business Investment Company (SBIC)</b></p> <ul style="list-style-type: none"> <li>▶ <b>Linked Deposits:</b> Tribal Nations may Utilize Linked Deposits and Federal Tax Credit to Establish Program</li> </ul> <p style="text-align: center;"><u>Example:</u></p> <p style="text-align: center;">75% Total Capital - Federal Funds 25% Total Capital - Banks / Corporations</p> <ul style="list-style-type: none"> <li>▶ <b>Direct Participation:</b> Tribal Nations may Participate Directly in Program</li> </ul> <p style="text-align: center;"><u>Example:</u></p> <p style="text-align: center;">\$15 Million - Federal Funds \$3.5 Million - Financial Institutions \$1.5 Million - Tribal Nation</p> <p style="text-align: center;"><b>The SBIC Program Enables Participating Tribal Nations to Commit \$20 Million to Reservation Economic Development on an Investment of \$1.5 Million</b></p>	<ul style="list-style-type: none"> <li>▶ Enables Tribal Nations to Utilize 3:1 Federal Funds and Linked Deposits to Finance Reservation Economic Development Projects</li> <li>▶ SBIC Program Provides Federal Tax Credit (39%) for Investments in Businesses Located on Reservations</li> <li>▶ Provides Capital Financing for Industrial Development Projects Utilizing Debt and Equity Finance</li> <li>▶ Provides Conduit for Banks to Invest in Reservation Industrial Development</li> <li>▶ Participating Tribal Nations may Achieve 13:1 Leverage of Financial Resources and Shift Over 90% of Investment Risk to the Federal Government and Participating Banks</li> <li>▶ Access to 3:1 Federal Supplemental Funds Effectively Doubles Yield from Investments in Reservation Enterprise Development</li> <li>▶ <b>First Nations SBIC Program Enables Tribes to Finance the Formation of Joint Venture Corporations as a Vehicle with which to Monetize Federal Preference Programs, Creating High Quality Reservation Employment and Tribal Investment Income</b></li> </ul>
<p>■ <b>Federal Preference Incentives</b></p>	<ul style="list-style-type: none"> <li>▶ Hubzone Set-Aside/Price Adjustment</li> <li>▶ Section 8(a) Set-Aside</li> <li>▶ Minority Business Set-Aside</li> <li>▶ Department of Defense Subsidy</li> </ul>	<ul style="list-style-type: none"> <li>▶ Federal Incentives Offer Tribal Nations the Opportunity to Develop a Diversified, Sustainable Economy and Achieve True Self-Determination</li> </ul>