Welcome New ITA Members

DGA/CTA
The Centre Technique D'Arcueil is one of the 19 centres of the DCE (Systems Evaluation and Test Directorate) of the DGA (Armament Procurement Agency). The CTA designs and carries out studies, expertise, tests and program management in the fields of: materials, lasers, vulnerability and protection of observation systems, use and development of geomatics, imaging-based intelligence and perception for robotics coordination of test methodology and facilities, and management of investment programs. For more information please visit their website at www.etca.fr.

Metem Corporation
Located in Parsippany, New Jersey, Metem Corporation was founded in 1962 and offers non-traditional machining for the Power Generation Industry including general contract, non-traditional, electric discharge, and electro chemical machining. For more information please contact Metem Corporation at 973-887-6635.

S. Letvin & Son
S. Letvin & Son, Inc. located in Los Angeles since 1947, are specialists in processing high temperature metals, including Titanium bulk weldables. They have developed a unique and proprietary process to return contaminated 6/4 Titanium fasteners or other very small titanium solids to specification 6/4 Titanium. Their final product is a 6/4 Titanium “Rotor Grade” feedstock; heavy, dense, clean and extremely consistent in chemistry and gases. For more information please contact 310.327.0590 or visit their website at www.titaniumscrap.com.

Allegheny Technologies and VSMPO-AVISMA Form Uniti LLC, A Joint Venture Serving a Variety of Titanium Markets
Pittsburgh, PA--4/29/03-- Allegheny Technologies Incorporated (NYSE:ATI) announced the formation of Uniti LLC, a joint venture with Russian-based VSMPO-AVISMA (Verkhnaya Salda Metallurgical Production Association - Berezniki Titanium-Magnesium Works) to produce and market a range of industrial commercially pure titanium products. Uniti’s target markets include chemical and petroleum processing, power generation, desalination, pulp & paper, construction & architecture, automotive and transportation, consumer and electronics. The joint venture will not be involved in commercial aerospace, military and medical markets. The joint venture is headquartered in Pittsburgh, PA.

Uniti integrates the synergistic use of the raw material, melting, hot rolling, finishing, research and technology resources of ATI and VSMPO-AVISMA. Uniti supplies a broad array of titanium products and is dedicated to enhancing customer service and developing new applications in the target markets for this lightweight and corrosion-resistant material.

James L. Murdy, president and chief executive officer of Allegheny Technologies said, “We are very pleased to be partnering with VSMPO-AVISMA in the pursuit of these titanium markets. Titanium has been growing in use in a variety of applications and Uniti should significantly accelerate this growth. This pro-competitive joint venture should permit Allegheny Technologies to increase our production of high-value products. Utilizing existing ad-

Continued on page 3
What’s New in Titanium?

HUGGY® Brand Earrings
Now Available in Titanium

Deerfield Beach, FL, January 23, 2003 — Spectore Corporation announced a strategic licensing agreement with Jordan Meryl, Inc., of Boca Raton, FL to produce and sell titanium HUGGY® earrings. The widely acclaimed earring line will be unveiled during the launch of Spectore’s new 2003 titanium ladies program, which includes rings, necklaces, bracelets and earrings. The program, including the HUGGY® earrings, will be available to Spectore Authorized Retailers.

Spectore Corporation, headquartered in Deerfield Beach, FL has long been recognized as the world leader in design and production of titanium jewelry and accessories. Adding to their already extensive line of fine jewelry sold through exclusive retailers worldwide, Spectore will produce an entire collection of titanium HUGGY® earrings featuring a variety of sizes, finishes and designs. Many styles will be available with diamonds or other precious stones, including sapphires.

Jordan Meryl, Inc., creators of the exclusive HUGGY® brand pioneered the popularity of the earring to one of the most recognized styles in today’s fashion. The addition of the Titanium Collection offers the trademarked design in a material that is as contemporary and fashion forward as the earring itself. The close fitting, hinged hoop earring snaps securely over the ear to provide a flattering look and comfortable fit for every woman. With the HUGGY® there are no ugly clips, no poking studs and no lost earrings.

To learn more about Spectore Corporation and their latest line of titanium HUGGY® earrings, or any of their other outstanding products, please call (954) 481-8422, email info@spectore.com or visit our web site at http://www.spectore.com. The entire line can also be seen at most major jewelry shows.

International Titanium Association Presents the Fundamentals of Titanium

Courses available on the following dates & locations:

June 12, 2003 — Dayton, Ohio
August 15, 2003 — Charlotte
September 8, 2003—Detroit, Michigan
October 15, 2003 — Monterey, California
November 5, 2003—Houston, Texas

This comprehensive workshop will provide attendees with detailed information on the types, uses, and properties of common titanium alloys. Attendees will leave with an understanding of applied titanium metallurgy fundamentals.

For detailed information please contact ITA at (303) 404-9400.
What’s New in Titanium?

Advanced manufacturing technology, ATI can produce these titanium products on the same equipment used for stainless steel, nickel-based and specialty steel alloys. The joint venture should offer ATI considerable revenue and income growth potential, particularly in our Flat-Rolled Products segment. Both ATI and VSMPO-AVISMA will continue to supply the commercial aerospace, military and medical markets independently.”

Dr. Vladislav Tetyukhin, president & chief executive officer of VSMPO-AVISMA said the following on this matter, "While we are currently going through a downturn in titanium production, we should not forget about the great future for titanium, and about the tremendous opportunities it can bring to humanity. In this difficult time we need to focus our efforts to accomplish this objective. In my opinion, multilateral cooperation and partnership of the two diversified companies, who each have almost half a century of experience in titanium production, is the key to success in achieving the goal set forth.”

Titanium product forms offered by Uniti include ingot, slab, sheet, strip, plate, billet, bar, seamless tubing and welded tubing. In 2002, titanium shipments to the target markets were approximately 45 million pounds with a total market value of about $400 million. A majority of these shipments were sheet, strip, plate and welded tubing products.

Carl Moulton has been named president of Uniti. Most recently, he was assistant vice president, strategic initiatives for Allegheny Technologies and prior to that he was senior vice president, commercial for Allegheny Ludlum, an ATI company. He has over 30 years of experience in the specialty materials industry. Moulton said, "We created Uniti to be a unique, competitive and customer-responsive company that is able to satisfy a broad array of needs of the industrial titanium user. Semi-finished products from VSMPO-AVISMA, such as slabs and hot-rolled bands, are to be positioned near ATI’s finishing facilities in order to supply the shortest, most reliable lead times in the industry. Extensive technology assets from each partner are available to aid our customers' product development efforts.”

Uniti expects to begin taking orders on June 1, 2003. Prior to that time, customers in the target markets should contact their normal sales representatives at either ATI or VSMPO-AVISMA. Manufacturing of Uniti™ products will be done through conversion agreements with VSMPO-AVISMA and ATI. In this innovative arrangement, ATI and VSMPO-AVISMA will each retain ownership of their respective facilities made available to Uniti. VSMPO-AVISMA and ATI will market and sell these joint venture titanium products exclusively through Uniti. Plans are for production to occur in Russia at VSMPO-AVISMA facilities in Verkhaya Salda and in Berezniki, Perm Region. ATI’s facilities involved in production are located in Houston, PA, Washington, PA, Vandergrift, PA, Monroe, NC, Richburg, SC, Albany, OR and Richland, WA. On agreement of the parties, additional capacities can be added for production in any region of the world.

This news release contains forward-looking statements. These statements are based on management’s current expectations and are subject to uncertainty and changes in circumstances. Actual results may differ materially from those projected in the forward-looking statements. Additional information concerning factors that could cause actual results to differ materially from those projected in the forward-looking statements is contained in Allegheny Technologies Incorporated’s filings with the U.S. Securities & Exchange Commission. Uniti brings together two major global titanium producers with complementary manufacturing and technical capabilities, Allegheny Technologies Incorporated (ATI) of the United States, and VSMPO-AVISMA (Verkhaya Salda Metallurgical Production Association - Berezniki Titanium-Magnesium Works) from Russia, to create a joint venture focused on titanium mill products for industrial and other non-aerospace, non-military and non-medical markets. Uniti integrates the synergistic use of the raw material, melting, hot rolling, finishing, research and technology resources of the two companies. Uniti is a supplier of a broad array of commercially pure titanium products for target markets in ingot, slab, plate, sheet, coil, bar, billet, welded tubing and seamless tubing. Uniti is dedicated to enhancing customer service and developing new applications in target markets for this lightweight and corrosion-resistant material. These target markets include chemical and petroleum processing, power generation, desalination, pulp and paper, construction and architecture, automotive and transportation, consumer and electronics.

Allegheny Technologies Incorporated is one of the largest and most diversified specialty materials producers in the world, with revenues of approximately $1.9 billion in 2002. The Company has approximately 9,650 employees worldwide and its talented people use innovative technologies to offer growing global markets a wide range of specialty materials. High-value products include nickel-based and cobalt-based alloys and superalloys, titanium and titanium alloys, specialty steels, super stainless steel, exotic alloys, which include zirconium, hafnium and niobium, tungsten materials, and highly engineered strip and Precision Rolled Strip® products. In addition, we provide commodity specialty materials such as stainless steel sheet and plate, silicon and tool steels, and forgings and castings. The Allegheny Technologies website can be found at www.alleghenytechnologies.com.

Verkhaya Salda Metallurgical Production Association (VSMPO) - Berezniki Titanium-Magnesium Works (AVISMA) is a producer of ingots of commercially
Ever wonder how certain shiny metals turn colors over time? Thanks to a $10,000 grant, Myra Halpin, a chemistry teacher at the N.C. School of Science and Mathematics in Durham, and her students will spend the next two years exploring why. Halpin, who is in her 14th year at the state school and a 33-year teaching veteran, recently received the grant from Toyota TAPESTRY, which is sponsored by Toyota Motor Sales, USA Inc. She co-wrote the grant proposal with Cathy McCluskey, a science teacher at East Wake High School. The grant is part of a nationwide effort to help teachers make science more engaging for students and improve science curriculums through long-term projects. Halpin explains grant proposal and teaching science.

Q. How did you come up with the idea for the project?
A. I'm always looking for things that will capture students' interests. That's the hardest thing to do today. If students have some ownership of what they are doing, then they are more interested in it. My goal for the project is to have students come away with a better understanding of electro-chemistry.

Q. What exactly will students be doing, and how will it help them better understand chemistry?
A. The project is about how to anodize titanium and niobium, two elements on the periodic table. Basically, they will take a piece of metal, put it in a solution and add a slow electrical voltage. Over time, oxygen will combine with the metal and form a coating on the surface. Depending on the voltage, you get different colors -- yellows, blues. It's hard to get red, but you do get a rosy color along with beautiful violets and royal blue.

Q. How does this sort of project improve the way science is taught?
A. Students will produce something they can take home with them. They will have a choice of making rings or earrings for their girlfriends or boyfriends. They can make other things out of the metals as well. With a project like this, students are more attentive, their attitudes...
Titanium Achievement Award Nominations

ITA Members now is the time to recognize someone in the titanium industry for exceptional contributions to the advancement of titanium applications and technology by submitting your titanium Achievement Nomination form. Nominees must have demonstrated outstanding achievement in his/her field and this achievement must be recognizable as benefiting the titanium industry at large.

The Titanium Achievement Awards are intended to be presented each year at the ITA Conference and Annual Meeting. More than one award may be granted in each year, at the discretion of the Board of Directors.

To be considered, nominations must be received, in writing, no later than July 1, 2003.

Members can download nomination forms from the home page of the ITA website at www.titanium.org.

About the DoubleTree Hotel

Come and relax in one of the 370 deluxe guest rooms, many with spectacular bay vistas. Play all day on any of the 17 world-class greens of the Monterey Peninsula. Swim in the heated pool, workout in the state-of-the-art fitness center or lavish yourself with a variety of treatments at the day spa.

Room Reservation Reminder…

The discounted room block rates for the conference are now available at the Doubletree Hotel. To book your reservation contact: 831-649-4511. Book early to receive the discounted room rate of $179. Remember to tell them you are with the International Titanium Association room block! PLEASE NOTE: Room block rates are valid until either the room block is sold out or before September 26, 2003.

Conference information can be found in the conference section of the ITA website at www.titanium.org.

Science Project continued from page 4

are much better and they enjoy coming to class. This makes it more fun for me, too. I don't have to stand up and lecture. I can see them getting something out of it. That's why science is fun to teach.

Q. Do you think students will grow tired of the project because of its length?
A. No. We do have two years to finish the project, but we work on it exclusively. This is something that we'll be doing more of in each of my classes, particularly when we study electro-chemistry.

Q. Is this sort of hands-on project something more schools should consider doing, and could you have done before now?
A. I think it is. Again, students learn better that way. Without the grant, though, we couldn't have done it before now because of budgetary constraints.

For more information on the class contact: Bill Seeley, Reactive Metals Studio, Inc, reactive@commspeed.net

ATI/VSMP0-AVISMA continued from page 3

pure and alloyed titanium and a complete range of rolled, extruded and forged products from titanium, aluminum and special steel alloys. JSC AVISMA is a leading titanium sponge producer. The plant produces magnesium and high-quality titanium sponge widely used for aerospace, shipbuilding, gas and oil equipment, power generation, and also titanium sponge for special alloyed steel. VSMP0-AVISMA Group develops and applies the most advanced technical processes and is constantly modifying its production facilities to meet all the most demanding requirements of worldwide customers. VSMP0-AVISMA Group holds 187 international quality certificates and cooperates with 240 international companies from 33 countries. The primary business of VSMP0-AVISMA Group is the production of materials for the high-tech fields of aerospace, energy, chemical and environmental industries. VSMP0 and AVISMA websites can be found at www.vsmsp.ru and www.avisma.ru.

For more information contact: Dan L. Greenfield at (412) 394-3004.
The Technical Discussion Forum is an excellent opportunity to educate the general public on titanium. This Forum allows individuals to post questions or seek advice on applications involved with titanium.

The openness and transparency of technical information benefits industry at large, a public forum such as this will only be successful if individuals respond to the posted questions. ITA relies on membership to actively participate in assisting with technical questions.

Recent Inquiries - Do you have a comment?

**Technical Discussion Forum:**
We use titanium equipment in our operations and have recently discovered that one of our production streams is generating significant levels of mercury. We have kicked off an investigation to identify potentially at-risk materials, but not being experts with Titanium (and its alloys) we are somewhat unclear regarding the risk that mercury may present to this class of materials.

We have both mercury vapor and mercury liquid present in predominately hydrocarbon GAS and hydrocarbon LIQUIDS streams. Can you advise if Titanium and its alloys are immune to mercury attack ie Liquid Metal Embrittlement, Amalgamation or other? If titanium or any of its alloys are at risk could you provide us with an advisory on which Alloys are at risk. Any literature or references that you may have on the subject would be much appreciated.

**Welcome to the ITA Technical Discussion Forum!**
Does anyone knows where to find a good Fatigue Curve for Commercially pure titanium, I looked in different places, but I can't find what I need. I need to find an SN curve for Ti sheet, Kt=3. Does anyone has any leads?

**Corrosion:**
Titanium Compatible With Ozone and Oxygen?
Could anybody tell me if titanium is compatible with ozone, pure oxygen or their mixture?

**Corrosion:**
Galvanic
If Titanium metal plate and 316SS plate are in contact while submerged in pH 10 solution- would there be galvanic corrosion? would that be severe?

**Specifications:**
A client contacted me looking for a titanium alloy to replace their current use of Inconel 601 in their process for developing and manufacturing sensors for the automotive industry (exhaust gas temperature sensors and mass flow sensors). For one of the sensors they would like to use titanium wire as conductor material because of the excellent corrosion resistance (anodic).

They are currently using Inconel 601 conductors (diameter 0.65 mm) but have noticed problems with the anodic corrosion. Can anyone help me by telling me what grades of Titanium (alloy) are commercially available between 0.6 - 0.8 mm of which the mechanical properties are comparable with Inconel 601and also have good weldability (laser welding)?

INCONEL 601 Technical Info
Tensile strength for annealed wire = 620 • E790 Mpa
Yield strength 0.2% = 240 • E480 Mpa
Elongation : 35 • E45
Any assistance would be greatly appreciated.

**Specifications:**
Is titanium flexible.. .would titanium pushrods exhibit flexing?
I am getting conflicting answers from other sources so I was hoping to get some input here. Is titanium or grade 8 titanium be flexible to any degree or would it break if bent? Would a pushrod made out of titanium exhibit any flexing or deflection during operation?

**Brazing:**
Soft Soldering to Titanium
Is it possible to join brass to Titanium using any form of soft solder?

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**To add a Topic to the Discussion Forum,**
E-mail ITA at: technical@titanium.org.
ITA Classified Ads

ITA On-line Classified Ads

ITA members rely on the ITA website for the latest news & upcoming events. The website reaches more qualified personnel for titanium related operations.

Advertise:
Equipment, Materials, Products, or Business Opportunities.

The Classified’s section of the ITA Web Site is located at www.titanium.org. Simply click on ITA E-News & Classified’s icon from the Home Page. When you submit a classified ad, ITA will proof your advertisement, process your payment, and post it to the website within 2-3 business days. ITA is not liable for confidentiality in classified advertising at any time and reserves the right to reject any advertising not in compliance with ITA standards.

This is a free service to ITA Members.

As of April 1, 2003 ITA will no longer post classified ads from Non-member companies.

Just imagine what this FREE advertising could do for your business!

Equipment For Sale:

Name of Your Company: Lectrotherm Inc.
Contact Name: Mike Pinney
Contact Email: mikepinney@lectrotherm.com
Description: Have three (3) cold wall induction crucible melting and precision casting systems available on an as-is or refurbished basis. The systems were originally designed to melt and centrifugally cast 25 lbs of titanium and titanium alloys. The furnace systems can also be adapted to Zirconium and other reactive alloys. The equipment is in very good condition and was originally manufactured by ALD Vacuum Technologies in 1996/97. To receive a full set of specifications, please contact Mike Pinney at Lectrotherm Inc 800/633-3584 or via e-mail: mikepinney@lectrotherm.com.

Materials Wanted:
None at this time.

Products For Sale:
None at this time.

Business Opportunity:
None at this time.

Upcoming Conferences & Exhibitions:

**June 2003**
- 2-4 Medical Design & Manufacturing East New York, NY USA
- 8-12 International Conference on Powder Metallurgy and Particulate Materials, Las Vegas, NV USA
- 9-12 14th AeroMat Conference & Exposition, Dayton, OH USA Visit ITA at booth #106!
- 12 Fundamentals of Titanium Workshop, Dayton, OH
- 10-12 Twin Cities Advanced Productivity Exposition Minneapolis, MN USA
- 15-22 45th Paris Air Show, LeBourget Airport, Paris, France
- 16-19 ASME Turbo Expo, Atlanta, GA USA

**July 2003**
- 7-11 Thermec’ 2003, Leganes, Madrid, Spain
- 13-18 10th World Conference on Titanium, Hamburg, Germany
- 14-18 14th International Conference on Composite Materials, San Diego, CA USA
- 22-24 Welding Course, Wah Change facility, Albany, NY USA

**August 2003**
- 10-14 53rd Sea Horse Institute Meeting, Wrightsville Beach, NC USA
- 15 Fundamentals of Titanium Workshop, Wrightsville Beach, NC USA
Current Membership Includes the Following Companies

Affinity International, LLC
Allegheny Technologies Incorporated
   Allegheny Ludlum
   Allegheny Rodney
   Allvac
   Titanium International Europe
   Wah Chang
AstroCosmos Metallurgical
BIAM / General Titanium Incorporated
BIBUS Metals AG
Body Cote Rancho Dominguez
Coastcast Corporation
CONSARC Corporation
Corrosion Materials
Deutsche Titan GmbH
DGA/CTA
Dynamet Incorporated
Dynamet Technology Incorporated
Dynamic Machine Works Incorporated
Excelco Developments Incorporated
F.W. Hempel & Co.
FAE S.A. Fabricación de aleaciones especiales
Fort Wayne Metals Research Products Corp.
GiE Metalle & Materialien GmbH
GIB Resources Incorporated
Grandis Metals
GTT Ginatta Tecnologie Titanio
Harvey Titanium Limited/Metals Aerospace International
Hi Tech Alloys
Howmet Corporation
Hyundai Titanium Company, Ltd.
International Titanium Powder
Itochu Non-Ferrous Materials Company, Ltd.
JSC "FIKO"
Keywell LLC Vac Air Division
K.P.C. Corporation
Lectrotherm
Luxembourg Company of Metals and Alloys S.A.
Metem Corporation
Monico Alloys Incorporated
Naval Surface Warfare Center
NF & M International Incorporated
North American Alloys
Northwest Institute for Nonferrous Metal Research
Pacific Cast Technologies, Inc.
Perryman Company
Plymouth Extruded Shapes
Plymouth Tube Company
President Company, Ltd.
President Titanium Incorporated
Reading Alloys Incorporated
Renton Coil Spring Company
Retech Systems LLC
Rixh Ti-Casting Industrial Co., Ltd.
Rome Metals Inc.
RTI International Metals Inc.
   Galt Alloys Incorporated
Sandinox Comercio
Sandvik Special Metals Corporation
S. Letvin & Son
Solar Atmospheres Incorporated
   Solar Atmospheres of Western PA
Specialty Metals Company
Spectore Corporation
Somet Company, Ltd.
STADCO
Stratcor Performance Materials, Inc.
Strohecker Incorporated
Suisman Titanium Corporation
Sumitomo Corporation of America
Sumitomo Titanium Corporation
Supra Alloys Incorporated
TechSpec Incorporated
Tibraisl Titanio Ltda.
TICO Titanium Incorporated
TIMET
   LOTERIOS S.p.A.
TDODIZE Company, Inc.
Titania S.p.A.
Titanium Engineers Incorporated
Titanium Fabrication Corporation
Titanium Finishing Company
Titanium Industries Incorporated
Titanium Sports Technologies LLC
Toho Titanium Company, Ltd.
Trans World Alloys Company
Tresis International, Inc.
Tricor Industrial Incorporated
Ulbrich Stainless Steels & Special Metals, Inc.
United Alloys Aircraft Metals, Inc.
United Titanium Incorporated
VALTIMET
VSMPO
Vulcanium Metals International
Wellmet International Inc
Western Titanium Incorporated
Xiamen Huaxia International Trading Co. Ltd
ZAK, Inc.

Founded in 1984 the International Titanium Association is a nonprofit networking trade association for the titanium industry. The primary focus of the Association is to promote the continued growth of the industry as well as educate the public on benefits and implementation of using titanium. Current membership includes 95 organizations.