



INTERNATIONAL PRECIOUS METALS INSTITUTE®

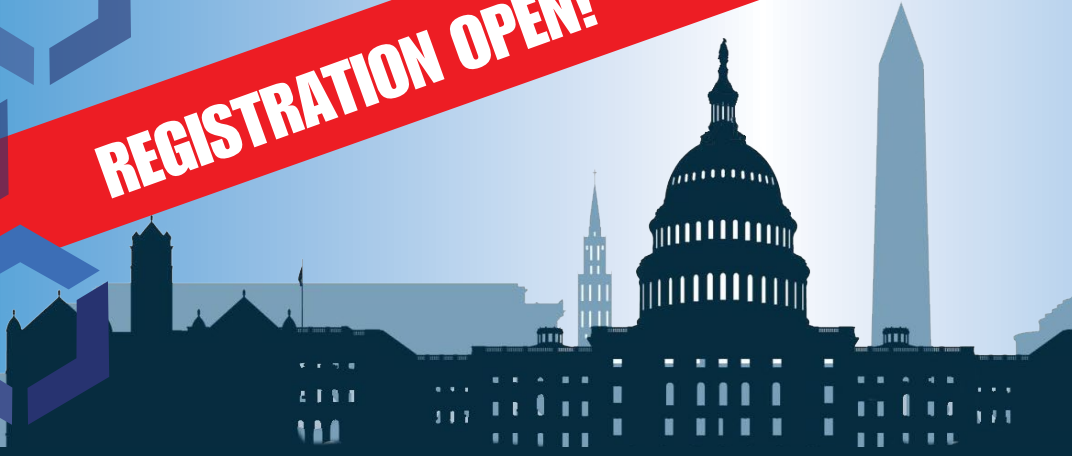
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Precious Metals News

Volume 45, Number 12

December 2021

REGISTRATION OPEN!



INTERNATIONAL PRECIOUS METALS INSTITUTE



Annual Legislative and Public Affairs Conference

An insider's look at global issues facing our industry.



February 8-9, 2022

The Army-Navy Club

901 17th Street, NW
Washington, DC 20006
(202) 628-8400

<https://www.armynavyclub.org/>

Room Rate: \$295
Room Block expires on January 4, 2022

Registration:
\$425 (members)
\$525 (non-members)

Register Here!
Sponsorships Available

Sandra Arrants | International Precious Metals Institute
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Annual Legislative and Public Affairs Conference Program of Events

February 8-9, 2022

The Army-Navy Club

Tuesday, February 8

- 1:30 pm** **Opening Remarks**, *Larry Drummond and Grace Stockley*
- 2:00 pm** **The Infrastructure Bill and the Impacts to EHS**
Chris Fitzpatrick, Johnson Matthey
- 2:30 pm** **The Future of PM & Critical Minerals: Will the Biden Administration and Congress Hinder or Help Manufacturers Grow The Circular Economy?**
Laura Berkey-Ames, BASF
- Break**
- 3:15pm** **Privacy & Cybersecurity**
Scott Schwartz, FidelityTrade
- 3:45pm** **The Biden Administration Trade Priorities
& 100 Days Critical Minerals Supply Chain Report**
Brian Ledgerwood, U.S. Department of Commerce, International Trade Administration
- 4:15 pm** **Not Sold on Gold:
Insights on What's Preventing Broad Adoption of Gold by Investors**
Jen Ropiak, World Gold Council
- 5:00 pm** **Networking**
- 6:00 pm** **Reception Sponsored by FidelityTrade and Delaware Depository**
- 7:00 pm** **The Army Navy Club Seafood Buffet**

Wednesday, February 9

- 8:00 am** **Continental Breakfast Sponsored by Techemet**
- 9:00 am** **Washington Update**, *Paul Miller, Miller Wenhold Capitol Strategies*
- 9:45 am** **PM Recycling - Rules, Regulations and Issues**
Amy Donohue-Babiak, Johnson Matthey
- 10:15 am** **Break**
- 10:30 am** **Auto Catalyst Theft and Regulations**
Steve Contreras, PGM of Texas and Oliver Krestin, Hensel Recycling
- 11:15 am** **Banking and Market Regulations**
Erin Middleton, CME
- 12:00 noon** **Lunch**
- The program will end after lunch**

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International Precious Metals Institute Educational and Scientific Foundation, Inc. Student Awards

Background

The IPMI Foundation is the charitable, scientific and educational affiliate of the International Precious Metals Institute (IPMI). One of the foundation's primary purposes is its Student Awards Program. Each year at its Annual Meeting, the Foundation awards up to \$100,000 in grants, internships, and cash awards to students, professors, and student advisors from around the world.

Scholarships to **research focusing on precious metals** include:

- **IPMI Student Awards**
Up to 3 IPMI-sponsored Student Awards in the amount of US\$ 5,000 to US\$ 15,000 each and US\$ 5,000 for one of the student advisors.
- **IPMI Corporate Student Awards**
Several corporate-sponsored Student Awards in the amount of US\$ 5,000 each sponsored by some of the most prestigious companies in the precious metals industry.

Eligibility

Students applying for an IPMI Student Award have to be enrolled in an academic training program (masters, Ph. D., postdoctoral research) performing fundamental or applied research focusing on any precious metal (Au, Ag, Pt, Pd, Ir, Rh or Ru), be it on the scientific side (catalysis, material, mining, refining, etc.) or on the commercial side (finance, marketing, etc.). Their expected graduation date must not be within the same year in which the award is received (e.g. an award winner of 2022 may not graduate before 2023).

[continued on page 4](#)



IPMI Foundation Student Awards, continued from page 3

Documents

The following application documents are required:

- Student CV (resume);
- Executive Summary of the research (maximum half-page), indicating the program the student is enrolled in, as well as the expected end-date of the program;
- Short research plan (maximum 2 pages) detailing research performed so far with results, as well as planned projects during the remaining time of the education program;
- Nomination/recommendation letter (maximum 1 page) from the supervising professor.

Students are welcome to add any other document they deem pertinent to their application (e.g. published papers, extended research details, academic grades, etc.).

Please submit one single pdf file containing all documents; the file name should be as follows: "student_last_name student_first_name - academic institution with country" (for example: Smith John - Columbia University USA).

Please mail the pdf application to: mail@ipmi.org

Student Award Winners

The student award winners are asked to attend IPMI's Annual Conference at the Hyatt Grand Cypress in Orlando (FL, USA) in June 2022, present their work in the Student Research Session and join all the conference professional and social events. They will have many opportunities to meet and interact with people from the precious metal industry.

Students joining the conference will be reimbursed for their travel expenses by the IPMI Foundation (economy flights, to be purchased at the lowest available rate). Conference registration (including meals) and hotel reservation will be made by the IPMI Foundation.

Timeframe

Date	Action
20 January 2022	Deadline for submitting application
ca. 31 March 2022	Award winners will be notified
11-14 June 2022	Conference in Orlando, FL

Contact

For questions or for additional information, please contact: mail@ipmi.org



Digital 45th Conference Proceedings Available

If you attended the Conference in Reno in person or virtually contact IPMI at mail@ipmi.org to get your complimentary copy.

If you did not attend and wish to purchase a copy you can find it at IPMI Store on our website www.ipmi.org.



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NEW DATES



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REGISTRATION OPEN

IPMI Winter Meetings

March 1 - 3, 2022

Hyatt Grand Cypress Resort - Orlando



Security & Anti Money Laundering - March 1

Auto Catalyst Seminar hosted by PGMRC - March 2

Sampling & Analytical - March 3

Registration Now Open!

Members:	1 day - \$425	2 days - \$650	3 days - \$800
Non Members:	1 day - \$525	2 days - \$750	3 days - \$900

The Palladium Challenge

Presented by the IPMI Educational and Scientific Foundation
and Sponsored and Promoted by Nornickel



NORNICKEL



Palladium is one of the Platinum Group Metals (PGMs), known for its catalytic capabilities and valuable properties. It is widely utilized in the automotive industry as an essential part of catalytic converters. Palladium is also used in: chemical and petrochemical catalysts; electronic devices production (especially MLCC's and connectors); as well as dental restoration and jewelry.

Nornickel is the global leader in palladium production. As the largest palladium producer, Nornickel feels responsible for developing the palladium market and promoting metal use in new areas. That is why Nornickel would like to encourage professionals worldwide to take a more detailed look at palladium and its potential applications in their research areas. In order to do that, Metal Trade Overseas SA, affiliate of Nornickel, in collaboration with IPMI, launches the "The Palladium Challenge", is an award granted to individuals and institutions who come up with the most promising technological solutions that may generate substantial demand for palladium.

Areas of Research

Projects from any field of science and technology can participate in the competition. However, palladium applications in the hydrogen economy (including hydrogen storage and cleaning films, catalysts for electrolyzers and fuel cells, and hydrogen sensors), battery technologies (with palladium as a battery energy density booster), sensors, industrial catalysts or alloys are seen as the most promising areas of the research.

Who Can Participate

Participation in The Palladium Challenge is not restricted. All laboratories, universities, individual scientists, engineers, and entrepreneurs with a great idea are encouraged to participate.

The Palladium Challenge Criteria

The winner(s) will be determined by a panel of renowned experts in science and technology and the PGM market. The panel's decision will be based on the following key criteria:

1. **The scientific novelty of the proposed project**
2. **Economic feasibility and sustainability of the project**
3. **Minimum annual palladium demand in thousands of troy ounces generated by the proposed application**

Intellectual Property Rights

Subject to the Official Rules of the Palladium Challenge, participants retain any intellectual property, if any, in the submissions and assume all responsibility for any protection thereof. IPMI assumes no responsibility or liability whatsoever for any publication, use or dissemination of any submissions in connection with the Palladium Challenge.

Participant Registration and Official Rules

Participation in the Palladium Challenge is subject to the Official Rules and Participant's agreement to be bound by the terms thereof.

IPMI Disclaimer

IPMI is committed to serving its members and supports education and the sustainable and environmentally responsible expansion of the use of the precious metals in all applications. Subject to the terms of the Official Rules, IPMI makes no representations or warranties regarding the results of the Palladium Challenge and shall remain free and clear of any liability in connection therewith.

The Palladium Challenge Awards

1st place – US\$200,000

2nd place – US\$100,000

3rd place – US\$50,000

Winners to be selected by September 2022

Register

To register, click on the palladium element symbol below. Your completed proposal must be submitted to IPMI by May 31, 2022.

Click Here to Register

PALLADIUM

Pd

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**Nornickel retains the right to make changes to the awards and/or decline to grant any specific award
In the event the Panel finds that no submission meets the contest criteria.**

Women in Precious Metals

Michelle Cullion

Sr. VP of Administration | Gannon & Scott

Michelle Cullion fell in love with accounting at her first intro class in high school. Although not for everyone, to this day she continues to employ that passion at Gannon & Scott in her role as Senior Vice President – Administration.

Attending Bryant College on a basketball scholarship, Michelle majored in Accounting Information Systems and minored in Legal Studies. She graduated in 2004 with a Bachelor of Science in Business Administration. In 2007, Michelle earned her Master of Science in Taxation degree from Bryant University and became a Certified Public Accountant in 2009. She also is a graduate of the 2010 AICPA Leadership Academy and a former board member of the RI Society of CPAs.

Prior to her current position at Gannon & Scott, Michelle was a Principal at DiSanto, Priest & Co. where she spent 13 years in public accounting focusing primarily on financial reporting and tax compliance for privately held manufacturing and technology companies. Michelle is also currently serving on the Board of Directors of Ashaway, Line & Twine Co, a Rhode Island textile

manufacturer best known for its production of racket strings and surgical suture material.

In her role at Gannon and Scott, a precious metals refiner, Michelle is a member of the senior management team. She manages the daily operations of the administrative group, provides management with metrics and reporting, is responsible for financial reporting requirements, and manages relationships with banks, vendors, and customers. She also manages the compliance team, including Anti-Money Laundering and Know Your Customer requirements.

Michelle's professional goal is to personify the Gannon & Scott values, "Be trustworthy, Be responsible. Provide service and value." Personally, Michelle enjoys spending time with her husband Chris and their children, Ryan and Nora. For fun, Michelle enjoys hiking and, in general, being outdoors. Her role in sports has evolved from a college athlete to an enthusiastic coach as she now finds herself coaching her kids' teams. Michelle believes in following her passion, being a dedicated mother and employee and living every day to her fullest.



Women in Precious Metals

Christina Rodrigues

Customer Service & Logistics | Gannon & Scott

A longtime accounts manager and shipping expert in the refining industry, Christina Rodrigues gained extensive experience from her leadership training as a Naval employee and her years of involvement within the precious metals industry.

“I love the industry, but I love the customers even more,” Christina says of her decades of experience. “I’ve worked with some of the smartest people, all from different industries.” From obtaining and servicing key accounts to building and managing customer service departments, she achieved record sales and customer retention levels.

In a prior role as a logistics coordinator, Christina developed a shipping manifest program that reduced a week’s worth of work down to just minutes—a program that is still in use 15 years later. As hazardous waste shipping and international freight logistics

continue to become more complex, Christina works to maintain current knowledge of EPA, DOT, and OSHA regulations. She also holds various OSHA and GHS certifications related to health and safety requirements and hazardous waste.

A Rhode Island native, Christina began her career at the Naval Education and Training Center in Newport, where she received management, leadership, and operations security training from the Navy. She went on to distinguish herself in the refining industry through her work as a customer service manager, shipping manager, and inside sales rep.



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79 Au Gold 196.967	47 Ag Silver 107.868	78 Pt Platinum 195.085	46 Pd Palladium 106.42	45 Rh Rhodium 102.906	77 Ir Iridium 192.22
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Recap of IPMI New England Chapter Networking Event November 17, 2021

On Wednesday, November 17th the New England Chapter of IPMI and their more than 50 guests (some from the New York Metro Chapter gathered for the first time in over a year and a half for their Fall Networking event at Iron Works in Warwick, Rhode Island.

Participants were happy to attend the “get-together” and as IPMI – NE Co-President Mike Mooiman aptly pointed out, “there were many “hugs - rather than handshakes”. The atmosphere was warm and inviting, and the festive décor allowed for a very relaxed, social evening.

Because of continuing regard for the safety of our guests, we chose to forego a buffet dinner and made the decision of selecting passed hearty, delicious appetizers and various food stations, including a large antipasto with all the trimmings, crudité platter, clam cakes & chowder and sliders both chicken and pulled pork. In addition, a full dessert table was available with coffee/tea toward the end of the evening.

Seating spaced accordingly, with both regular and high-top smaller tables around the room which allowed for everyone to talk and become reacquainted and meet new friends.

Opening remarks were made by Co-President Mike Mooiman, followed by welcoming comments from IPMI – President Miguel Perez-Santalla, Executive Director, Larry Drummond also added his good wishes and spoke about the upcoming national and international events scheduled in 2022. Mike Mooiman took over the “chair” once again attending to the brief business of the annual meeting, which included the renewing of terms of two of the members of the board, Messrs. King and Mooiman.

After a brief affirmative vote, festivities resumed attendees mingled until around 9:30pm in the evening and no one seemed in a rush to leave. Several attendees asked about our next meeting and committed to attend. We informed them we are planning a Winter Dinner Meeting with speaker, to be held in February or March of 2022, with perhaps two distinct speakers to discuss diverse topics related to our industry.

In summary, this was a successful event for the chapter and a benefit to the members/guests of our regional membership.

Kudos to all our members, sponsors, guest's and hard-working Board that made a truly memorable evening.



Autocatalyst Theft Update – November 2021

- Car catalyst theft is on the increase on a global basis, with €M of converters stolen and traded everyday
- This can be from
 - Catalyst bricks being transported between producers, canners and OEM's
 - Converters stolen from cars in the public and from company fleets
 - Thefts at scrap yards and recycling companies
- **This is now gaining focus at levels of the total supply**
- There are many initiatives underway including
 - Pro active law enforcement agencies (UK & South Africa)
 - In US multiple states have introduced new bills to regulate the catalytic converter business
 - Other scrap agencies such as ISRI, ARA introducing scrap business codes of conducts
 - Tighter KYC due diligence rules being implemented via IPA , LBMA & LPPM
 - This will require complete supply chains to ensure have proof of KYC
- IPMI have set up, at the request of it's members an Ad Hoc Committee to review this subject the charter is below with sub committees in the USA and Europe – both sub committee's have met once
- **This is a key initiative and the responsibility for everyone in our industry**
- Please feel free to contact us to discuss further and we hope you can join the committee

IPMI - Ad Hoc Committee Autocatalyst Theft - Charter

Mission

- To address the issues of the threat of the increasing trend of Autocat thefts to the scrap recycling and refining supply chain and the possibility of over-regulation developing in various geographic segments. Create a list of sound responsible sourcing / compliance practices to best protect the supply chain of our members at every level.

Objectives

- Educate members on the increasing incident rate of Autocat thefts and developing regulations in each geographic area
- Educate members on the serious threat this issue poses to their business in terms of reputation, financing and refining of their material
- Work collaboratively with other organizations such as, but not limited to ISRI, ARA and IPA to address this problem from different angles and geographic markets and to ensure that the IPMI members voices/point of view is heard.
- Determine best ways to get involved so our members who work in this segment do not get over-regulated including, but not limited to, educating and influencing various Government regulators on the issues and processes at all stages of the scrap supply chain.
- Work collaboratively with SECAM on sound AML practices for Responsible Sourcing in other precious Metal market segments and determine applicability to this segment.

Membership

- Open to all IPMI members.

Chairperson(s)

- Co-chair - Steve Contreras (US) & Oliver Krestin (EU)

Activities, Duties, and Responsibilities

- Organize meetings ~2 times per year to include relevant catalytic converter security and compliance topics for the IPMI community. Co-chairs are responsible for organizing the speakers and agenda for each meeting. IPMI Executive Director organizes location and logistics of meeting (US).

The Future of Gold 2022

REGISTRATION OPEN!



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CPM Group

Thursday, April 7, 2022

NY Events • 4 West 43rd Street • New York, NY 10036

A One-day Round Table Seminar and Discussion about the Future of Gold

Supply • Fabrication Demand • Investment Demand
Official Transactions • Market Structures • Prices

Moderated Panel Discussions

- The Future of Gold Mine Production and Total Supply
- The Future of Gold Fabrication Demand
- The Future of Gold Prices (Lunch Panel)
- The Future of Gold Investment Demand
- The Future of Gold Markets: Trends and Conditions

Registration:

\$375 (members) • \$475 (non-members)

Gold Sponsor: \$2000

General Sponsor: \$1000



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Contact: Sandra Arrants at mail@ipmi.org

Larry Drummond, IPMI
(732) 966-0966 • ljd@ipmi.org

Jeffrey M. Christian, CPM Group LLC
(917) 865-1615 • jchristian@cpmgroup.com

European Chapter Dublin Conference

European Chapter of the IPMI Dublin Conference

Clontarf Castle was built in 1172 on the location of the famous battle of Clontarf fought on 23rd April 1014 where Brian Boru High King of Ireland's forces slayed the Viking army forcing them from Ireland.

Now a picturesque hotel on the outskirts of Dublin City centre, it was the perfect venue for the 7th European Chapter IPMI Conference.

After postponing the 2020 conference as a COVID precaution, the launch of the 2021 Conference sparked high initial interest with over 180 people registering leaving a venue at capacity with a long waiting list. As we are all aware, at the end of November a new variant hit us, cases rose, and new European wide restrictions led to many cancellations. We were still left with a healthy attendee list of over 120 people from 20 plus countries.

Our subject of "the role of precious metals within a circular economy" which given the recent COP26 led to some excellent presentations and lengthy discussions. This really brought home the growing importance of the precious metals and recycling industry in our battle against climate change.

On Monday Jonathan Butler, Mitsubishi Corp gave us his usual informative insight to the future markets and the role of precious metals within the future automotive market. Michael Belton, Alfred H Knight followed up with how the circular economy is affecting the mining industry. Neil Meader, Metal Focus then gave us food for thought on the future silver market with levelling mining outputs and continued growth in demand, supporting the green economy.

After tea our focus turned to the growing Hydrogen economy with excellent market, technology, and product presentations from Jenny Watts, SFA Oxford and Philipp Walters, Heraeus.

After a hearty dinner and some liquid refreshments, we all retired into the Castle rooms looking forward to Day 2. Alexy Kornienko, Krastsvetmet introduced us to the growing role of secondary refining

in reducing our overall global carbon footprint before Ruth Leland, Johnson Matthey introduced everyone to the concept of new product design to recycling to avoid excess waste and scrappage.

Oliver Krestin, Hensel Recycling highlighted the excess metal losses in open loop refining and discussed ways we can reduce this. Finally, we heard from Antonio Gonzalez, Metal 78 and their exciting new technology to hydro metallurgically process spent automotive catalyst.

In addition to these presentations across the two days we heard updates from Executive Director Larry Drummond on IPMI activities and an introduction to the Platinum Group Metals Refining Committee as well as progress of the IPMI Ad Hoc Autocatalyst theft committee co run by Oliver Krestin.

All in all, if either in person or virtually and excellent set of presentations and I thank all our presenters.

Looking into 2022 I hope we can all meet more in person and as a chapter we still plan to run our wine tasting event in London during the May Platinum week as well as our conference later in the year, dates and locations to be advised.

Lastly, I would like to thank everyone who attended, people who wished to attend, our patron members and sponsors of the event Platinum – Nippon PGM / DOWA / Tanaka and Metalor Technologies Gold – BASF, Hensel Recycling, Techemet, and Mastermelts Group of Companies Silver – Heraeus, Johnson Matthey, Women in PGM's, Elemental Holding Group and Recycling Group.

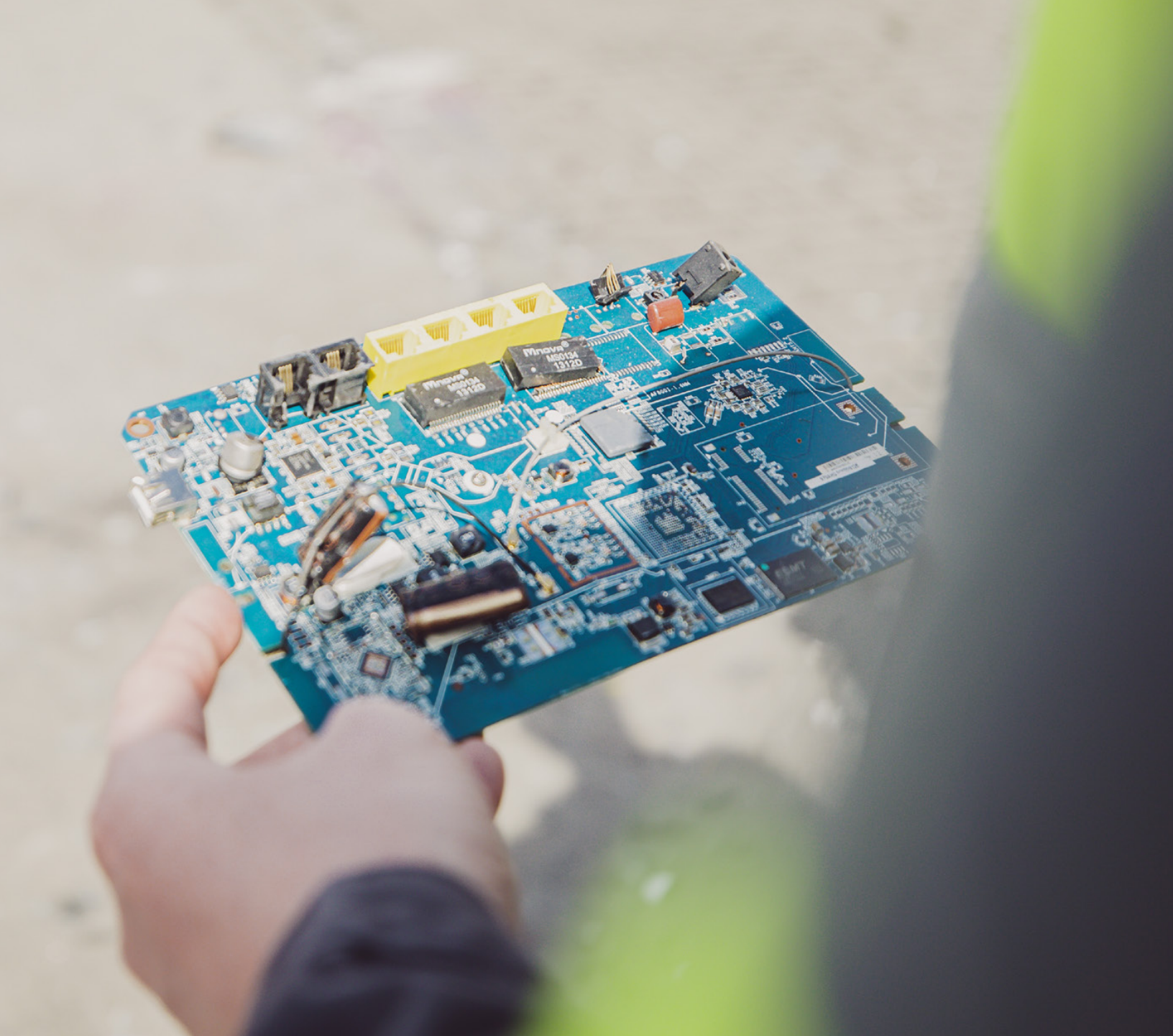
Finally, I would like to thank Jonathan Jodry for his tireless work as president over recent years and wish him luck in Japan and I hope everyone has a safe break and a prosperous 2022.

Lee M Hockey

President of the European Chapter of the IPMI

European Chapter Dublin Conference





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Precious Metals Market News

Gold

- **Gold advances as dollar retreats after Fed verdict**

- Gold gained more than 1% on Thursday, buoyed by weakness in the dollar after the U.S. Federal Reserve sped up the withdrawal of its pandemic-era stimulus in a move largely priced in by bullion investors. The dollar slipped, making gold cheaper for holders of other currencies and helping bullion gain despite a bounce in riskier assets as the Fed prepared to tame rising prices.
- Apart from a weaker dollar, “there are multiple supportive elements for gold, including geopolitical issues and pent-up physical demand,” StoneX analyst Rhona O’Connell said.

<https://www.nasdaq.com/articles/precious-gold-advances-as-dollar-retreats-after-fed-verdict>

- **Gold Price Forecast: Bulls stay in charge and eye \$1,1810**

- Gold gained more than 1% on Thursday, buoyed by weakness in the dollar after the U.S. Federal Reserve sped up the withdrawal of its pandemic-era stimulus in a move largely priced in by bullion investors.

<https://www.fxstreet.com/news/gold-price-forecast-bulls-stay-in-charge-and-eye-1-1810-202112162150>

Silver

- **Silver Demand to Surpass 1 Billion in 2021, Reaching 6-Year High**

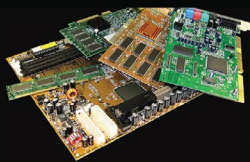
- The demand for silver is projected to exceed one billion for the first time in six years, with global silver demand reaching 1.29 Boz in 2021. According to the Silver Institute, demand has risen across the board, from manufacturers of solar panels and electronics to jewelers to investors in physical silver bars and coins, and is showing no signs of slowing in 2022 and beyond thanks to expanding global connectivity. Summa Silver, SilverCrest Metals Inc., First Majestic Silver, Alexco Resources, and Mag Silver Corp stand to benefit from the growing demand for silver.

<https://www.prnewswire.com/news-releases/silver-demand-to-surpass-1-billion-in-2021-reaching-6-year-high-301443764.html>

continued on page 18



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Precious Metals Market News, continued from page 17

- **Undersupplied silver to follow base metals into deficit**

- “The recovery in silver industrial demand from the pandemic will see this segment achieve a new high of 524 million ounces (Moz). In terms of some of the key segments, we estimate that photovoltaic demand will rise by 13% to over 110Moz, a new high and highlighting silver’s key role in the green economy,” states a press release that accompanied the Silver Institute’s Interim Silver Market Review webcast.

<https://www.kitco.com/commentaries/2021-12-10/Undersupplied-silver-to-follow-base-metals-into-deficit.html>

Platinum

- **Global platinum production to rebound in 2021**

- “The largest increase in platinum demand was seen within the automotive sector, at 27.1% growth. This was largely used for manufacturing autocatalysts, a system built into car exhausts that reduces dangerous exhaust pollutants. However, this growth in demand is expected to slow between 2021 and 2025, expanding at a compound annual growth rate (CAGR) of just 2.2% due to the gradual replacement of internal combustable engine (ICE) cars with electric vehicles (EVs). Jewelry fabrication was another key contributor to 2021’s platinum recovery, with demand growing by 5.3%.”

<https://www.miningreview.com/platinum-group-metals/global-platinum-production-to-rebound-in-2021/>

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INDUSTRY NEWS

Precious Metals Market News, continued from page 18

Palladium

- **Biden to Toughen Auto Emissions Limits to Counter Climate Change**

- The Biden administration is preparing to impose more stringent limits on car and truck emissions in an effort to clamp down on a top U.S. source of the greenhouse gases fueling climate change. The standards, set to govern passenger cars and light trucks from model years 2023 through 2026, will reverse a Trump-era move to relax the mandates and are set to be issued within days, according to three people familiar with the matter.

<https://www.bloombergquint.com/business/biden-to-toughen-auto-emissions-limits-to-counter-climate-change>

- **OSU research pushes auto industry closer to clean cars powered by direct ethanol fuel cells**

- To tackle those problems the research team, which also included OSU's Maoyu Wang and scientists from Southern University of Science and Technology in China and Argonne National Laboratory, developed high-performance palladium alloy catalysts that use less of the precious metal than current palladium-based catalysts.
- "Our team showed that introducing fluorine atoms into palladium-nitrogen-carbon catalysts modifies the environment around the palladium, and that improves both activity and durability for two important reactions in the cell: the ethanol oxidation reaction and the oxygen reduction reaction," Feng said. "Advanced synchrotron X-ray spectroscopy characterizations made at Argonne suggest that fluorine atom introduction creates a more nitrogen-rich palladium surface, which is favorable for catalysis. Durability is enhanced by inhibiting palladium migration and decreasing carbon corrosion."

https://theworldlink.com/news/local/osu-research-pushes-auto-industry-closer-to-clean-cars-powered-by-direct-ethanol-fuel-cells/article_914b8d74-56af-11ec-908e-a74398360870.html

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Precious Metals Market News, continued from page 19

Ruthenium & Iridium

- **Researchers develop advanced catalysts for clean hydrogen production**

- An active phase of a catalyst based on amorphous iridium hydroxide exhibited efficiency 150 times that of its original perovskite structure and close to three orders of magnitude better than the common commercial catalyst, iridium oxide.

<https://phys.org/news/2021-12-advanced-catalysts-hydrogen-production.html>

- **Researchers find new class of catalysts producing ammonia under mild conditions**

- Today's Haber-Bosch and the other processes involved in industrial-scale production require high temperatures (more than 400°C) and high pressure (more than 150 bar). Those conditions are needed to break the strong bonds in nitrogen and react with hydrogen to form ammonia (NH₃).
- Their process allows them to synthesize ammonia at temperatures as low as 300 °C (573 K) and at pressures as low as 1 bar. Practical application of these catalysts shows promise concerning small-scale production of ammonia based on renewable energy.

<https://www.greencarcongress.com/2021/11/20211123-vegge.html>

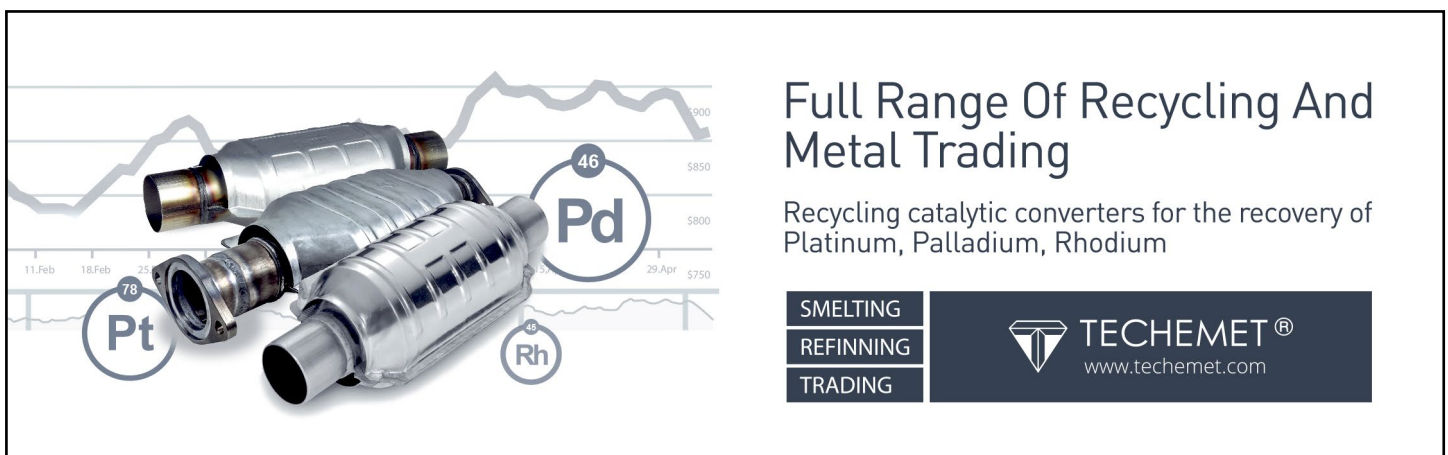
Precious Metals Recycle

- **A hot approach to mining urban waste for precious metals**

- The flash Joule heating process heats waste materials to 3,127° C in milliseconds with a jolt of electricity, vaporizing the precious metals. The vapors are transported from the flash chamber under vacuum to another vessel, a cold trap, where they condense into their constituent metals.
- The process detailed in Nature Communications is also energy-conserving: it consumes about 939 kWh/ton of material processed, 80 times less energy than commercial smelting furnaces and 500 times less than laboratory tube furnaces. Over 60% of gold in a sample, and over 80% of silver, palladium and rhodium can be recovered.

<https://insights.globalspec.com/article/17775/video-a-hot-approach-to-mining-urban-waste-for-precious-metals>

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Professor Robert Grubbs, Henry J Albert Award Winner 2018 Passes Away

The Victor and Elizabeth Atkins Professor of Chemistry at Caltech, passed away on December 19, 2021. He was 79 years old.

Grubbs was a co-winner of the 2005 Nobel Prize in Chemistry for the development of the metathesis method in organic synthesis. Metathesis—which means “change places”—is a chemical reaction, aided by special catalysts, in which double bonds between carbon atoms are broken and remade in ways that cause specific chemical groups to change places. In this way, functional features of molecules can be selectively stripped out and replaced with groups that were previously part of another compound.

In particular, Grubbs developed powerful new catalysts that enabled the synthesis of custom-built molecules with specialized properties that enable, for example, the creation of specialized plastics or more effective drugs for the treatment of disease. The metathesis process, because of its relative simplicity, has led to the development of industrial and pharmaceutical methods that create fewer waste products, making them more efficient and environmentally friendly.

“Bob was an inspiration to Caltech colleagues and to scientists around the world, for his human qualities as much as for his pathbreaking contributions to research and society. We will keenly miss his wisdom and vision,” says Caltech president Thomas F. Rosenbaum.

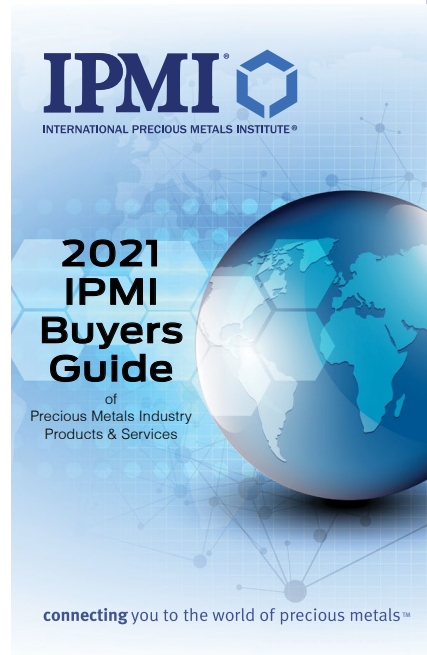
In addition to being the recipient of the IPMI Henry



J Albert Award, his other honors included the recipient of the Benjamin Franklin Medal from the Franklin Institute (2000), the Arthur C. Cope Award from the American Chemical Society (2002), and the American Institute of Chemists Gold Medal (2010). He was inducted into the Florida Inventors Hall of Fame in 2015. Grubbs was a member of the National Academy of Sciences and the National Academy of Engineering; a fellow of the American Academy of Arts and Sciences and the American Chemical Society; an honorary fellow of the Royal Society of Chemistry; and a foreign academician of the Chinese Academy of Sciences. He received honorary degrees from the University of Florida, Michigan State University, Georgia Institute of Technology, Dickinson College, University of Crete in Greece, University of Warwick in the United Kingdom, and Rheinisch-Westfälische Technische Hochschule (RWTH) Aachen University in Germany.

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2022

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Apr 7	Gold Seminar • New York, NY
Jun 11-14	46th Annual Conference • Hyatt Regency Grand Cypress • Orlando, FL
Sep 12-16	Platinum Week • New York, NY