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### A Message from the Chair

Greetings! We have had an unusual and often frustrating year, beginning with the cancelling of the 2020 APS March Meeting, as we all adapt to life under a COVID 19 environment. I hope all of you have found ways to be both safe, productive, and successful as we work together to navigate through the difficulties, restrictions and dangers posed by this COVID 19 environment.

I am sure that everyone is looking forward to attending the upcoming virtual March Meeting—I know that I am. As you'll see below, DMP has organized an exciting program that covers a comprehensive range of topics of contemporary interest for our members. DMP has a significant presence at the March Meeting through our many Focus Topic sessions. Each DMP Focus Topic provides a structure to gather contributed and invited talks together in a series of coordinated sessions that foster increased discussion on a specific area. Please join me in thanking our Chair-Elect, Rachel Goldman and her team of Focus Topic organizers who worked very hard to assemble an excellent series of talks in these sessions. You will find more details about the Focus Topic sessions later in this Newsletter. Additionally, this is the time to propose new Focus Topics for next year's March meeting (currently planned for February 28-March 4, 2022 in Chicago, Illinois). Please do so by contacting either Vivien Zapf, who will be the DMP Program Chair for the 2022 March Meeting, or DMP Secretary/Treasurer, Steven May, using the instructions provided later in this Newsletter. Please consider suggesting invited speakers to these Focus Topics when the selections and organizers are announced.

Our Vice-Chair, Vivien Zapf, our Past-Chair, Nitin Samarth, our 2020 Past-Chair Amanda Petford-Long, and Rachel have also organized five invited symposia. These are:

- The DMP Past Chair's Symposium: Tools that Explore Materials Physics (C09) on Monday afternoon, featuring Margaret Murnane, Joseph Stroscio, Eli Rotenberg, Chunhui Du, and Juan Idrobo.
- The DMP 2020 Prize Symposium (J35) on Tuesday afternoon, featuring the recipients of the 2020 APS Medal (Miriam Sarachik), the 2020 James C. McGroddy Prize (Mikhail Eremets), the 2020 Adler Lectureship (Chang-Beom Eom), the 2020 Edward Bouchet Award (Nadya Mason), and the 2020 IUPAP C-10 Young Scientist Prize (Andrea Young).
- The DMP 2021 Prize Symposium (L35) on Wednesday morning, featuring the recipients of the 2021 James C. McGroddy Prize (Ivan Bozovic, Darrell Schlom, and James Eckstein), the 2021 Adler Lectureship (Robert Cava), and the 2021 IUPAP C-10 Young Scientist Prize (Andrew Potter).
- The "Physics for Everyone" Symposium (U36) on Thursday afternoon which is centered on physics in popular culture and features James Kakalios, Patrick Johnson, David A Weitz, Anissa Ramirez, and Diandra Leslie-Pelecky.
- The Greene Dissertation Award Session (V64) on Thursday afternoon: Veronika Sunko (2020), Xiao Mi (2020), Hsiang-Hsi Kung (2020), Ilya Belopolski, Mallika Randeria.

We were able to retain the Prize Session for the DMP 2020 Prize Winners who were unable to present their talks last year due to the cancellation of the March meeting. Do make sure to put these invited symposia and our Focus Topic sessions on your meeting calendar! (Note that all times listed for talks in the 2021 March Meeting program are Central Daylight Time, USA)

The annual DMP business meeting is scheduled for 6-7 pm CDT on Tuesday, March 16, 2021. Topics to be discussed in that meeting include the Focus Topics for the 2022 March meeting, including any new proposals for Focus Topics. Please do attend: this is your chance to provide direct input into the agenda for the 2022 March meeting.

DMP also plays a really important role in recognizing the stellar scientific achievements of our members through awards and election to APS Fellow. The two major awards are the David Adler Lectureship Award and the James C. McGroddy Prize for New Materials; nomination packages for these are due 6/1/2021. APS Fellow nominations are due 5/3/2021. Complete information on the [nomination process](#) is available online. I urge you to help us by nominating an excellent and diverse slate of colleagues who have advanced scientific frontiers in materials physics.

As you might imagine, it takes many volunteers to keep all these DMP activities going. My contributions to the DMP Chair-line would have been impossibly difficult without the wisdom, advice, and helpful guidance of the more experienced members of the executive committee, particularly Nitin Samarth (Past-Chair) and Sam Bader (APS Councilor). Nitin will be leaving the DMP Executive Committee in March and Sam left the APS Council in December 2020. Please join me in giving them a huge round of

applause for their leadership! And, once again, many thanks to Rachel Goldman, DMP Chair Elect, for organizing the 2021 March Meeting! I have also had lots of help this year from our new Secretary/Treasurer, Steven May—thank you, Steve! Thanks also go to DMP Executive Committee Members at Large who are completing their terms, Judith Yang and James Rondinelli: they both helped enormously with the Focus Topic organization and service on other DMP committees over the past 3 years. Finally, I would like to extend a warm welcome to the newly-elected members of the DMP Executive Committee: Vice-Chair elect, Yuri Suzuki, and Members-at-Large elect, Judy Cha and Jorge Munoz, as well as our new APS Councilor, Peter Schiffer.

I've been honored to serve as DMP Chair this past year, and I thank all of you for the opportunity to contribute to the Division.

Please join me in sending best wishes and thoughts of support to all those who have been adversely affected by the COVID 19 pandemic.

Toni Taylor, DMP Chair

## New Members of the Executive Committee

The following members were elected to serve on the DMP Executive Committee:

- Vice Chair: Yuri Suzuki
- Councilor: Peter Schiffer
- Member at Large: Judy Cha
- Member at Large: Jorge Muñoz

Peter began his term on January 1, while Yuri, Judy, and Jorge will join the Executive Committee following the March Meeting. We congratulate the new members of the Executive Committee and look forward to their participation and leadership!

We thank Nitin Samarth, Sam Bader, James Rondinelli, and Judith Yang for their leadership and service to DMP over the last three years. We are especially grateful to Sam, whose recently concluded term as Councilor represents 3 out of his 21 years of elected service within the APS. The Materials Physics community has benefitted immensely from his dedication and leadership. Thank you Sam!

## DMP Executive Committee Members for 2021-2022

The Executive Committee Officers and Members-at-Large for the 2020-2021 year, (who begin their terms begin following the March Meeting):

### Officers:

- Chair: Rachel Goldman, (04/21 - 03/22), University of Michigan
- Chair-elect: Vivien Zapf (04/21 - 03/22), Los Alamos National Laboratory
- \*Vice-chair: Yuri Suzuki (04/21-03/22), Stanford University
- Past Chair: Toni Taylor, (04/21 - 03/22), Los Alamos National Laboratory

- Councilor: Peter Schiffer, (01/21 - 12/23), Yale University
- Secretary/Treasurer: Steven May, (04/20 - 03/23), Drexel University

### **Members-at-Large:**

- Kyle Shen, Cornell University (04/19 – 03/22)
- Oana Jurchescu, Wake Forest University (04/19 – 03/22)
- Anand Bhattacharya, Argonne National Lab (04/20 – 03/23)
- Peter Fischer, Lawrence Berkeley National Lab (04/20 – 03/23)
- \*Judy Cha, Yale University (04/21 – 03/24)
- \*Jorge Muñoz, University of Texas at El Paso (04/21 – 03/24)

*\*Newly elected*

## **Call for DMP Focus Session Topics for the 2022 APS March Meeting**

**(February 28 – March 4, 2022 in Chicago)**

The Division of Materials Physics sponsors a wide range of focus topics as its primary structure for the March Meeting. Typically spanning several sessions throughout the March Meeting, focus topics allow an in-depth view of forefront materials physics research areas and connect invited speakers to associated contributed abstracts.

Each year, the existing set of focus topics is evaluated for inclusion in the next year's program. In addition, new candidates for focus topics are considered based on timeliness, an assessment of the community interest, and uniqueness with the existing DMP program and those of sister units. Ideas coming from the DMP community at large are an extremely important part of this process.

To that end, the DMP Executive Committee solicits your input for the 2022 focus topics slate. New focus topics should represent a significant topic that would support three or more March Meeting sessions (each session typically has one invited talk and 12 related contributed talks).

Please send proposals for new focus topics to DMP Vice-Chair [Vivien Zapf](#) or DMP Secretary/Treasurer [Steven May](#) by 5 p.m. EST on Monday, March 8, 2021. Please include:

- Descriptive title of the focus topic
- The nominator's name, affiliation, and email address
- A brief abstract noting timeliness and uniqueness of the topic relative to the existing program
- A description of the intended audience that supports the size and scope of a focus topic
- Suggestions for possible organizers

- Any additional information you would like to provide that will help the DMP Executive Committee in its decision-making process will be appreciated. For your reference, a list of the 2021 DMP focus topics is included below.

If you have any questions or would like assistance in the preparation of your proposal, please contact DMP 2022 Program Chair [Vivien Zapf](#).

Thank you in advance for your help in this extremely important part of planning for the future success of the DMP program.

Sincerely,

**Vivien Zapf**, DMP Vice-chair and 2022 Program Chair

**Rachel Goldman**, DMP Chair-elect and 2021 Program Chair

## **DMP Focus Topics at the 2021 APS March Meeting**

07.01.01 Topological materials: synthesis, characterization, and modeling

07.01.02 Dirac and Weyl semimetals: materials and modeling

07.01.03 Topological superconductivity: materials and modeling

07.01.04 Magnetic topological materials

08.01.02 Dopants and defects in semiconductors

08.01.03 Multiferroics, magnetoelectrics, spin-electric coupling, and ferroelectrics

08.01.04 Organometal halide perovskites: photovoltaics and beyond

09.01.01 Fe-based Superconductors

11.01.01: 5d/4d transition metal systems

12.01.01: 2D Materials: Synthesis, Defects, Structure and Properties

12.01.02: 2D Materials: Semiconductors

12.01.03: Devices from 2D Materials: Function, Fabrication and Characterization

12.01.04: 2D Materials: Metals, Superconductors, and Correlated Materials

12.01.05 Computational Design and Discovery of Novel Materials

13.01.01: Nanostructures and Metamaterials

13.01.02: Electron, Exciton, and Phonon Transport in Nanostructures

13.01.03: Complex Oxide Interfaces and Heterostructures

13.01.04: Materials for Quantum Information Science

14.01.01: Surface and Interface Science of Organic Molecular Solids, Films, and Nanostructures

19.01.07: Tools for Exploring Materials Physics at the Frontier of Time and Length Scales

**DMP also co-sponsors the following focus topics led by other APS units:**

01.01.02 Organic Electronics (DPOLY, FIAP, DMP) [same as 08.01.06]

01.01.16 Molecular Glasses (DPOLY, DSOFT, DCP, DMP) [same as 02.01.34, 05.01.10]

01.01.18 Polymers and Soft Solids at Interfaces: Tribology, Wear, Rheology and Interactions (DPOLY, DSOFT, GSNP, DFD, DMP) [same as 02.01.36, 03.01.39, 20.01.13]

01.01.27 Polymer Crystals and Crystallization (DPOLY, DSOFT, DMP) [same as 02.01.42]

04.01.08 Biomaterials: Structure, function, design (DBIO, DMP, DSOFT, DPOLY) [same as 02.01.47, 01.01.41]

08.01.07 Optical Spectroscopic Measurements of 2D Materials (FIAP, DMP, GIMS) [same as 19.01.06]

10.01.01 Magnetic Nanostructures: Materials and phenomena (GMAG, DMP)

10.01.02 Emergent Properties of Bulk Complex Oxides (GMAG, DMP, DCOMP) [same as 16.01.32]

10.01.03 Magnetic Oxide Thin Films and Heterostructures (GMAG, DMP, DCOMP) [same as 16.01.33]

10.01.04 Chiral Spin Textures and Dynamics, Including Skyrmions (GMAG, DMP)

10.01.05 Spin transport and Magnetization Dynamics in Metals-Based Systems (GMAG, DMP, FIAP) [same as 22.01.04]

10.01.06 Spin-Dependent Phenomena in Semiconductors, including 2D Materials and Topological Insulators (GMAG, DMP, FIAP, DCOMP) [same as 08.01.01, 16.01.36]

10.01.07 Frustrated Magnetism (GMAG, DMP)

10.01.08 Low-Dimensional and Molecular Magnetism (GMAG, DMP)

16.01.01 Matter in extreme environments (DCOMP, DMP)

16.01.02 Building the bridge to exascale: applications and opportunities for materials, chemistry, and biology (DCOMP, DBIO, DCP, DPOLY, DMP, DAMOP) [same as 04.01.33, 05.01.14, 01.01.48, 06.01.08]

16.01.03 Electrons, phonons, electron-phonon scattering, and phononics (DCOMP, DMP)

16.01.04 First-principles modeling of excited-state phenomena in materials (DCOMP, DCP, DMP) [same as 05.01.15]

16.01.05 Machine learning for quantum matter (DCOMP, GDS, DMP) [same as 23.01.02]

16.01.13 Physics and effects on transport of ion-ion correlation in electrolyte materials (DCOMP, DCP, DMP) [same as 05.01.17]

## March Meeting: Virtual Format and DMP Business Meeting

The 2021 APS March Meeting will take place from March 15 - 19 over a virtual format. Meeting details, registration and program can be found [here](#). A list and schedule of DMP-sponsored sessions is [here](#).

Please note that the second morning session will start at 11:30 AM (and end at 2:30 PM) and the afternoon session will start at 3:00 PM and end at 6:00 PM. These times are shifted back compared to previous March Meetings to accommodate the virtual format. Please also note that all times are Central Daylight Time (CDT).

The DMP Business Meeting will be held during the March Meeting on Tuesday, March 16 from 6:00 p.m. – 7:00 p.m. This is your opportunity to interact with the Executive Committee and to become informed of the activities of the Division.

## Award and Prize Winners

### James C. McGroddy Prize for New Materials

**Darrell G. Schlom**, Cornell University

**Ivan Božović**, Brookhaven National Laboratory

**James N. Eckstein**, University of Illinois at Urbana-Champaign  
For pioneering the atomic-layer-by-layer synthesis of new metastable complex-oxide materials, and the discovery of resulting novel phenomena.

### **David Adler Lectureship Award**

**Robert Cava**, Princeton University  
For enabling significant advances in the field of topological materials by recognizing, discovering and fabricating novel compounds, and demonstrating with collaborators that such materials show the expected exotic topological properties.

### **IUPAP Young Scientist Prize in the Structure and Dynamics of Condensed Matter (C10)**

**Andrew C. Potter**, University of Texas at Austin  
For Fundamental Contributions to the Theory of Many-Body-Localization and Non-Equilibrium States of Quantum Matter

### **Richard L. Greene Dissertation Award in Expt. Condensed Matter/Materials Physics**

**Ilya Belopolski**, Princeton University  
For the discovery of the first 3D topological magnet and of several novel Weyl semi metals from ARPES experiments.

**Mallika Randeria**, Massachusetts Institute of Technology  
For the discovery of and measurements on a quantum Hall nematic state on the surface of Bismuth from low temperature STM experiments.

### **2020 APS Fellows nominated through DMP**

**Geoffrey S. D. Beach**, Massachusetts Institute of Technology  
For pioneering contributions to the understanding of chiral exchange interactions, spin-orbit torques, domain wall and skyrmion dynamics in magnetic thin film materials, heterostructures and nanostructures.

**Javier Junquera**, Universidad de Cantabria  
For seminal contributions to ab initio materials physics of ferroelectric size effects, formation of polar skyrmions, and emergent physical phenomena in them.

**Richard B. Kaner**, University of California, Los Angeles  
For outstanding contributions to the physics, chemistry, and materials science of nanostructured conducting polymers, superhard metals, and new forms of carbon including superconducting fullerenes, carbon nanoscrolls, and graphene.

**Maria Antonietta Loi**, University of Groningen  
For seminal contributions to understanding and manipulating charge transfer and excitonic states in optoelectronic devices.



**Scott X. Mao**, University of Pittsburgh

For contributions to the study of deformation physics and fracture of metals and nanocrystalline materials, and for pioneering work on in-situ transmission electron microscopy on phase transformation and electrochemical-lithiation.

**Nini Pryds**, Technical University of Denmark

For pioneering contributions in understanding the transport of ionic and electronic conduction at confined oxide heterointerfaces, and the response of these material systems to external stimuli, including electric and magnetic fields, light and stress.

**Yoshinori Tokura**, RIKEN

For pioneering contributions to multiple physical phenomena within the broad field of complex correlated electronic systems encompassing high temperature superconductivity, colossal magnetoresistance in manganites, multiferroic manganites and magnetic skyrmions.

## Division of Materials Physics Ovshinsky Student Travel Awards

The Ovshinsky Student Travel Awards were established to assist the career of student researchers. The awards are named after Stanley and Iris Ovshinsky, who had a very strong interest in, and commitment to, scientific education. The awards have been endowed by the Ovshinsky family, their colleagues at Energy Conversion Devices (ECD) companies and all their numerous friends from many social, intellectual and business relationships.

We are extremely grateful to the Ovshinsky family for this award. Since the original launch of the award, the family have provided further gifts to endow the awards.

The recipients of the 2021 Ovshinsky Student Travel Awards for Materials Physics are:

- **Halima Giovanna Ahmad**, University of Naples "Federico II"
- **Hanof Alkhaldi**, University of Texas at Arlington
- **Justin Boddison-Chouinard**, University of Ottawa
- **Sushree Dash**, Michigan Technological University
- **Dingxin Fan**, University of Texas at Austin
- **Shivajee Govind**, University of Pennsylvania
- **Uthpala Herath**, West Virginia University
- **Hiago Maurilio Lopes Carvalho**, Federal University of Alfenas
- **William Nunn**, University of Minnesota
- **Pushpa Paudel**, Kent State University
- **Ulises Ramirez Meza**, Centro de Investigaciones en Optica
- **Andrew Rowberg**, University of California, Santa Barbara
- **Xu-Ping Yao**, University of Hong Kong

## Division of Materials Physics Post-Doctoral Travel Awards

The DMP Post-Doctoral Travel Awards were established to recognize innovative materials physics research by Post-Doctoral researchers that will be presented at the APS March Meeting. The Awards are supported through the Division of Materials Physics.

The selection of the recipients of the DMP Post-Doctoral Travel Awards is based on the research quality, the impact of the research at the March Meeting and the innovative contribution of the post-doctoral researcher.

The recipients of the 2021 DMP Post-Doctoral Travel Awards are:

- **Gaurab Rimal**, Rutgers University
- **Chandra Adhikari**, North Carolina Central University
- **Mengen Wang**, University of California, Santa Barbara
- **Jianwei Huang**, Rice University
- **Anil Rajapitamahuni**, University of Minnesota
- **Chun-Jiong Huang**, University of Hong Kong

## March Meeting: DMP Sponsored Symposia & Special Events

### DMP Invited Symposia

- **Monday March 15th, 2:30 PM – 5:30 PM, C09.** DMP Past Chair's Symposium: *Tools that explore materials physics* [Juan Idrobo, Margaret Murnane, Joseph Stroschio, Eli Rotenberg, Chunhui Du]
- **Tuesday March 16th, 2:30 PM – 5:30 PM, J35.** DMP 2020 Prize Session: *Adler Lectureship* [Chang-Beom Eom], *McGroddy Prize for new Materials* [Michael Eremets], *Edward Bouchet Award* [Nadya Mason], *APS Medal* [Miriam Sarachik], *IUPAP C-10 Young Scientist Prize* [Andrea Young].
- **Wednesday March 17th, 8:00 AM – 11:00 AM, L35.** DMP 2021 Prize Session: *Adler Lectureship* [Robert Cava], *McGroddy Prize for new Materials* [Ivan Bozovic], *McGroddy Prize for new Materials* [James Eckstein], *McGroddy Prize for new Materials* [Darrell Schlom], *IUPAP C-10 Young Scientist Prize* [Andrew Potter].
- **Thursday March 18th, 11:15 AM – 2:15 PM, S62.** "Physics for Everyone" Symposium *Physics in Popular Culture* [Patrick Johnson, David A Weitz, James Kakalios, Diandra Leslie-Pelecky, Anissa Ramirez]
- **Thursday March 18th, 2:30 PM – 5:30 PM, V64.** "Greene Dissertation Award Session: [Veronika Sunko, Xiao Mi, Hsiang-Hsi Kung, Ilya Belopolski, Mallika Randeria]

### Graduate Student Lunch with the Experts

Tuesday, March 16, 12:30 - 2:00 p.m.

Students may participate in an informal discussion with an expert on a topic of interest to them. Information on joining these discussions will be provided on the APS March Meeting website.

DMP Supported Tables include:

- Rachel Goldman, University of Michigan, "Adventures in semiconductor nanopatterning"
- Steven May, Drexel University, "Planning for a Postdoc and the Faculty Job Search"
- Amanda Petford-Long, Argonne National Lab, "Women in science: careers in national labs and academia"
- Nitin Samarth, Penn State, "Topological Quantum materials"
- Toni Taylor, Los Alamos National Lab, "Ultrafast materials physics"
- Vivien Zapf, Los Alamos National Lab, "Women in Physics"