Advancing our understanding of science, at the molecular level, drives innovation in everything from new and improved materials, to the detection and treatment of disease, to the capture and storage of energy, to our understanding of earth systems and the universe. Telluride Science Research Center (TSRC) scientists are pioneering the next big advances in science and technology.
Laying the Foundation

2017 was an exciting year as the Telluride Science Research Center (TSRC) continued to grow and diversify its workshop programming while starting to implement the recommendations from the 2016 strategic plan. Along with evaluating the opportunities and risks for the organization, the strategic planning effort had been a chance to articulate TSRC’s brand, better understand what was special about the organization, why the scientists valued it, why TSRC was effective at advancing science, how the organization had grown organically over the years, and why TSRC globally sits at the top of collaborative science centers. It became very apparent that the Telluride community’s relaxed and friendly nature is a large component to the organization’s success. Our scientists feel at home here.

The question that remained was how we would accommodate growth and help keep Telluride and TSRC affordable for our scientists. In the spring of 2017, Ah Haa School for the Arts was beginning preparations for a move into a larger facility and approached TSRC about purchasing the Depot. Having been the most reoccurring renter of the Telluride Depot for both meetings and social events, TSRC Staff and Board of Directors viewed the acquisition of the Depot as an ideal solution to many of the challenges currently facing the organization.

On June 15, 2017, TSRC put the Depot under contract. While two home developers waited for the option to purchase, TSRC was the only nonprofit organization to make an offer on this iconic and National Historic building. TSRC intends to put the Depot into a trust so that it always remains a public asset for the community.

TSRC is very excited about collaborating with community to make the Depot a truly exceptional resource for both TSRC, other non-profits, and for the public. Not only do we want the community to feel a sense of ownership of the Depot, but even more so a sense of ownership over the success of TSRC, because together we are helping to export from Telluride the science and technology that is changing the world.

My best,

Mark Kozak
TSRC Executive Director
Why a Facility?

A dedicated home and year-round facility has been an aspiration of TSRC for many years. Surpassing 550 meetings and 14,000 scientist visits since 1984, TSRC has built a reputation as one of the leading venues for scientific collaboration. TSRC workshop programming continues to grow every year, but no programming space is available to support significant expansion. This “good problem” is compounded by a leasing period with the Telluride School District that has shortened to seven weeks.

A facility will allow TSRC to expand its programming season to year-round, increase its impact on the global advancement of science, enhance interaction between visiting scientists and the community, further support K-12 STEM education in the region, increase the organization’s financial sustainability, and ensure that TSRC can remain in Telluride.
Vision of a Permanent Home

The Depot renovation and restoration design creates three new programming rooms while retaining the large “Gallery” room as a place for eating and socializing. With the new facility, TSRC will be able to host meetings year-round.

Throughout the year, unused programming rooms will be made available to other nonprofits in the community, with a priority given to organizations that promote science & technology, STEM education, and innovation.
A Groundswell of Community Support

With a self-supporting annual operating budget, 2017 was one of the few times TSRC has reached out to the community for financial support. Seeing people’s excitement for TSRC and our plans for the project has been the most rewarding aspect of this campaign. TSRC scientists, staff, and board of directors want our community to feel a sense of ownership of the success of TSRC. Telluride’s inspiring natural splendor and its welcoming people are often cited by our top scientists as a draw to TSRC; these factors contribute greatly to making TSRC special. By supporting TSRC, we support major scientific collaborations and developments, and we as a community are changing the world from Telluride.

With great help from local realtor, Sally Puff Courtney, who joined the TSRC Board of Directors in 2018, TSRC raised over $2M in pledges in a five-month period towards a campaign goal of $8.25M ($5.25M to purchase and $3M to restore and renovate the Depot).
TSRC is gratefully indebted to those donors who appreciate TSRC's value to both the global science and local Telluride communities and who are joining us in our efforts to support burgeoning molecular science.

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Miles* & Nicole Cook
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Lou Mintz & Beverly Crilly
Alan & Marcia Docter
Patrick* & Marisa Dwyer
Tim & Mary Erdman
Billy Harbert
Carol & John Keogh
Adam & Diane Max
Aela & Don Morgan
Jim & Alexis Pugh

Reeves Family
Samueli Foundation
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John Straub*
Carsten Ullrich
University of Chicago –
Institute for Molecular Engineering
Ilya Vakser
YuHuang Wang
Stephen White

*TSRC Board Member
WORKSHOPS
JUNE 10-14, 2017
The Theory and Practice of Catalysis
Horia Metiu and Fabio Ribeiro

JUNE 20-24, 2017
New Frontiers in Electron Correlation
Toru Shiozaki and Dominka Zgid
Clathrate Hydrates Fundamentals: Bridging Molecular Structures to Microscopic Properties and Behavior
David Wu and Arnaud Desmedt
The Complexity of Dynamics and Kinetics from Single Molecules to Cells
Tamiki Komatsuzaki, Steve Presse, and Steve Berry
Enabling Technology for Reactions and Processes
Greg Dudley, Jason Hein, and Nicola Pohl
Molecular Engineering of Soft Matter: Spanning Small Molecules to Macromolecules
Shikha Nangia, Sapna Sarupria, and Arthi Jayaraman

JUNE 26-30, 2017
Polymer Physics
Karl Freed, Jack Douglas, M. Muthukumar, and Tim Lodge
Competing Interactions and Colossal Responses in Transition Metal Oxides
John Mitchell, Jaime Fernandez-Baca, Andy Christianson, and Mike Norman
Protein Electrostatics
Bertrand Garcia-Moreno and Marilyn Gunner
Chemistry and Dynamics in Complex Environments (Chem DiCE)
Rigoberto Hernandez and Ward Thompson
Macromolecular Crowding
Tom Record and Simon Ebbinghaus
Challenges in Dissecting and Understanding Nucleic Acid Electrostatics
David Case, Daniel Herschlag, Hashim Al-Hashimi, and Magdalena Gebala
Solar Solutions to Energy and Environmental Problems
Jao van de Lagemaat and Ksenija Glusac

JULY 11-15, 2017
Intrinsically Disordered Proteins: How Conformational Landscapes Control Intra- and Inter-Molecular Interactions of IDPs
Arvind Ramanathan, Chakra Chennubhotla, Christopher Stanley, and Richard Kriwacki
Defect Chemistry and Physics of Low Dimensional Materials
Phil Collins and YuHuang Wang
Designing Biomolecular Switches
Lillian Chong, Stewart Loh, and Andrew Woolley
Nanomaterials: Computation, Theory, and Experiment
Svetlana Kilina, Eric Hobbie, George Nazin, and Dmitri Kilin

JULY 17-21, 2017
Excited States: Electronic Structure and Dynamics
Christine Isborn, Neepa Maitra, Xiaosong Li, and Andre Schleife
Spectroscopy and Dynamics of Coupled Anharmonic Vibrations of Floppy Molecular Systems
Zlatko Bacic, Tucker Carrington, and Mark Tuckerman
Spontaneous Coherence and Collective Dynamics
Eric Bittner and Carlos Silva
Nonequilibrium Phenomena, Nonadiabatic Dynamics and Spectroscopy
Alexey Akimov, Sergei Tretiak, and Vladimir Chernyak
Advances in Theory of Electronic Resonances
Anna Krylov, Ksenia Bravaya, and Thomas Jagau
Stochastic Methods in Electronic Structure Theory
Energy Landscapes: Structure, Dynamics and Exploration Algorithms
Janett Prehl, Karl Heinz Hoffmann, and Christian Schoen
Regulating the Interfacial Physicochemical Processes of Organic Semiconductors by Design
Chad Risko and Natalie Stingelin

JULY 24-28, 2017
RNA Dynamics
Kathleen Hall, Karissa Sanbonmatsu, and Lois Pollack
Ion Channel Biophysics
Rob Coalson and Maria Kurnikova
Quantum Effects in Condensed-Phase Systems
Scott Habershon and Thomas Markland
Photo Physics of Biomolecular Ions
Klavs Hansen and Perdita Barran
**Telluride School on Theoretical Chemistry**
Jack Simons

**Optimizing Thermodynamic Systems**
Karl Heinz Hoffmann and Peter Salamon

**Energy Transport in Nanoscale Gaps and Molecular Junctions**
Pramod Reddy, Edgar Meyhofer, and Juan Carlos Cuevas

**Vibrational Dynamics**
Karin Hauser and Kevin Kubarych

**Frontiers and Challenges in Laser-Based Biological Microscopy**
Sophie Brasselet and Jonathan Liu

**New Developments in Coupled-Cluster Theory**
Anna Krylov and Juergen Gauss

**Protein Dynamics**
Paul Fenimore, Takayuki Nishizaka, and Rafael Brüschweiler

**Quantum Transport in Nanoscale Molecular Systems**
Michael Thoss, Latha Venkataraman, and Ferdinand Evers

**YAP/TAZ and TEAD: At the Crossroads of Cancer**
Guy Weinberg, Peter Salamon, and John Lamar

**Epithelial Physiology and Cell Biology**
Thomas Kleyman, John Cuppoletti, My Helms, and Peter Synder

**Information Engines at the Frontiers of Nanoscale Thermodynamics**
Sebastian Deffner, Korana Burke, Tommy Byrd, and Jim Crutchfield

**Emerging Methodologies for Paramagnetic NMR and Dynamic Nuclear Polarization in Biological and Inorganic Materials**
Ann McDermott and Tatyana Polenova

**Control of Proton and Electron Transfers in Redox Catalysis**
Aaron Appel, Wendy Shaw, and John Peters

**Cystic Fibrosis: Ecology, Evolution, and Eradication**
Ryan Hunter and Katrine Whiteson

**Computational Materials Chemistry**
De-en Jiang, Graeme Henkelman, Jeffrey Greeley, and Richard Hennig

**Accelerating Reaction Discovery**
Kay Brummond, Dean Tantillo, and Matthias McIntosh

**Telluride School on Biomolecular Structure and Dynamics: Theory and Experiment**
John Straub and Arthur Palmer

**Telluride School on Theoretical Chemistry**
Jack Simons, Joan-Emma Shea, Thomas Miller, Toru Shiozaki, and Suri Vaikuntanathan

**Free Energy Calculations: Three Decades of Adventure in Chemistry and Biophysics**
Greg Voth, Wei Yang, and Pengyu Ren

**Scientists in Residence Summer Program**

**SUMMER PROGRAMS**

**SUMMER SCHOOLS**

**Telluride School on Stochastic Approaches to Electronic Structure Calculations**

**Telluride School on Time-Dependent Density Functional Theory**
Neepa Maitra, Christine Isborn, and Andre Schleife

**Telluride School on Theoretical Chemistry**
Jack Simons, Joan-Emma Shea, Thomas Miller, Toru Shiozaki, and Suri Vaikuntanathan

**CONFERENCES**

**Free Energy Calculations: Three Decades of Adventure in Chemistry and Biophysics**
Greg Voth, Wei Yang, and Pengyu Ren

**SUMMER PROGRAMS**

**Scientists in Residence Summer Program**
As a way of giving back to the community, TSRC supports regional STEM education through its partner, Pinhead Institute. TSRC scientists volunteer their time to inspire the next generation of scientists and innovators. Public outreach has been an important part of its mission since its inception in 1984.

Korana Burke, Mathematician, University of California, Davis

Korana made a special trip to the region to work with children in the Telluride, Ridgway, Norwood, Paradox, and Montrose schools. She used everyday observations to demonstrate chaos theory and the implications of nonlinear dynamics.

Scott Showalter, Associate Professor of Chemistry; Associate Professor of Biochemistry and Molecular Biology, Pennsylvania State University

Motivated by Scott’s laboratory’s research interests in type 2 diabetes, he presented to kids in Telluride and Ridgway on the hidden sugars in much of the American youth diet, how our bodies metabolize it, and active engagement in the amount of exercise needed to burn the calories from one teaspoon of sugar.
Transforming Telluride into a college town, world-renowned TSRC scientists share their curiosity and thirst for knowledge with the community through the TSRC Town Talks summer lecture series.

TOWN TALKS SUMMER 2017

Simulating the Quantum World on Classical Computers
2017 R. Stephen Berry Lecture
Garnet Chan, California Institute of Technology

Benign by Design from the Nanoscale to the Human Scale
Rigoberto Hernandez, John Hopkins University

Water: Separating Science from Pseudoscience
Kenneth Jordan, University of Pittsburgh

New Materials for Solar Energy Capture and Conversion
Natalie Stingelin, Georgia Institute of Technology and Chad Risko, University of Kentucky

Four Billion Years of Fun in the Sun: The Photochemical Properties of DNA and Their Role in Minimizing UV Damage
Bern Kohler, The Ohio State University

Molecules and Light: The Story of Life, Death, and Our Quest for Knowledge
Anna Krylov, University of Southern California

“Fingerprinting” CO2 for Better, Safer Carbon Capture and Storage
Sophia Hayes, Washington University in St. Louis
TSRC’s budget is developed and approved annually by the Board of Directors. TSRC’s finances are managed by Shugars & Company Certified Public Accountants and Consultants, and audited by Green & Associates LLC. TSRC’s financial calendar ends annually on December 31. The 2017 Annual Report includes financial statements for the 2016 and 2017 calendar years.

### STATEMENT OF FINANCIAL POSITION

December 31, 2017 (with comparative financial as of December 31, 2016)

<table>
<thead>
<tr>
<th>ASSETS</th>
<th>2017</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$533,004</td>
<td>$282,209</td>
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<tr>
<td>Investments</td>
<td>332,094</td>
<td>501,822</td>
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<tr>
<td>Accounts Receivable</td>
<td>10,055</td>
<td>2,646</td>
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<tr>
<td>Prepaid Expenses</td>
<td>80,159</td>
<td>88,995</td>
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<tr>
<td>Pledges Receivable</td>
<td>600,000</td>
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<tr>
<td>Equipment, Net of Depreciation</td>
<td>265,535</td>
<td>2,820</td>
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<tr>
<td><strong>Total Assets</strong></td>
<td>1,820,847</td>
<td>$878,492</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LIABILITIES &amp; NET ASSETS</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts Payable &amp; Accrued Liabilities</td>
<td>$36,361</td>
<td>$141,138</td>
</tr>
<tr>
<td>Deferred Revenue</td>
<td>148,349</td>
<td>65,335</td>
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<tr>
<td>Long Term Debt</td>
<td>-</td>
<td>-</td>
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<tr>
<td><strong>Total Liabilities</strong></td>
<td>184,710</td>
<td>206,473</td>
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<tr>
<td>Net Assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporarily Restricted</td>
<td>1,219,316</td>
<td>339,638</td>
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<tr>
<td>Unrestricted</td>
<td>416,821</td>
<td>332,381</td>
</tr>
<tr>
<td><strong>Total Net Assets</strong></td>
<td>1,636,137</td>
<td>672,019</td>
</tr>
<tr>
<td><strong>Total Liabilities &amp; Assets</strong></td>
<td>1,820,847</td>
<td>$878,492</td>
</tr>
</tbody>
</table>
STATEMENT OF ACTIVITIES

December 31, 2017 (with comparative financial as of December 31, 2016)

REVENUES, GAINS AND OTHER SUPPORT

<table>
<thead>
<tr>
<th>Unrestricted</th>
<th>Temporarily Restricted</th>
<th>2017</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration Fees</td>
<td>$392,777</td>
<td>$392,777</td>
<td>$393,579</td>
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<tr>
<td>Workshop Support</td>
<td>43,649</td>
<td>43,649</td>
<td>10,445</td>
</tr>
<tr>
<td>Lodging Revenue</td>
<td>966,526</td>
<td>966,526</td>
<td>857,661</td>
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<tr>
<td>Food Revenue</td>
<td>35,553</td>
<td>35,553</td>
<td>50,681</td>
</tr>
<tr>
<td>Contributions</td>
<td>141,337</td>
<td>15,000</td>
<td>1,003,215</td>
</tr>
<tr>
<td>Investment Income</td>
<td>6,563</td>
<td>7,976</td>
<td>11,056</td>
</tr>
<tr>
<td>Unrealized Gain/(Loss) on Investments</td>
<td>18,749</td>
<td>13,963</td>
<td>54,742</td>
</tr>
<tr>
<td>Other Revenue</td>
<td>73</td>
<td>73</td>
<td>7,996</td>
</tr>
<tr>
<td>In Kind Contributions</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Net Assets Released from Restriction</td>
<td>22,686</td>
<td>(22,686)</td>
<td>-</td>
</tr>
<tr>
<td>Total Revenue, Gains, and Other Support</td>
<td>$1,627,913</td>
<td>879,678</td>
<td>2,507,591</td>
</tr>
</tbody>
</table>

EXPENSES

<table>
<thead>
<tr>
<th>2017</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Expenses</td>
<td>$1,168,487</td>
</tr>
<tr>
<td>Supporting Services Expenses</td>
<td>374,986</td>
</tr>
<tr>
<td>Total Expenses</td>
<td>1,543,473</td>
</tr>
<tr>
<td>Change in Net Assets</td>
<td>84,440</td>
</tr>
<tr>
<td>Net Assets, Beginning of Year</td>
<td>332,381</td>
</tr>
<tr>
<td>Net Assets, End of Year</td>
<td>$416,821</td>
</tr>
</tbody>
</table>

2017 WORKSHOPS

The 2017 season represented research and collaboration in the following fields of science:

- **Biomedical**: 16
- **Materials**: 9
- **Energy**: 6
- **Fundamental Research**: 13
- **Graduate Schools**: 4
- **Environmental**: 1
Over three decades, the Telluride Science Research Center developed a unique environment that allows scientists to see the larger picture and to tackle big, cross-cutting problems. TSRC’s success comes from nurturing a research atmosphere that encourages collaboration, teamwork, and open minds. In this way, TSRC dedicates itself to addressing today’s complex problems and to stimulating the scientific and engineering breakthroughs needed for both progress and a sustainable future.

James Crutchfield – University of California, Davis
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Chris Rauchnot, Operations Manager

PROGRAM STAFF
Michael Fortenberry
Sarah Friedberg
Gorio Osha
Hailey Redd
Kole Shugars

TSRC INTERN
Tyler Jansen, Science Writer

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