

Christoph Keplinger

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Current Research Interests

- Soft robotics, muscle-mimetic actuators, stretchable electronics, functional polymers, renewable energy

Appointments

Aug 2015 - Present	Assistant Professor, University of Colorado Boulder Mechanical Engineering & Materials Science and Engineering
Jul 2018 - Present	Mollenkopf Faculty Fellow, University of Colorado Boulder
Nov 2018 - Present	Co-founder and Chief Science Officer (CSO), Artimus Robotics (www.artimusrobotics.com) Spin-out commercializing the HASEL technology invented in the Keplinger Research Group
Dec 2012 - Jul 2015	Postdoctoral Research Fellow, Harvard University George M. Whitesides Group, Department of Chemistry and Chemical Biology
Dec 2011 - Nov 2012	Postdoctoral Research Fellow, Harvard University Zhigang Suo Group, School of Engineering and Applied Sciences
Sep 2008 - Sep 2011	Graduate Research Fellow, Johannes Kepler University of Linz, Austria Siegfried Bauer Group, Department of Soft Matter Physics

Education

2008 - 2011	PhD (Dr. techn.) in Physics (with highest distinction) Johannes Kepler University of Linz, Supervisor: Siegfried Bauer (Soft Matter Physics)
Sep 2009 - Mar 2010	Visiting PhD student Harvard University, Supervisor: Zhigang Suo (Mechanics of Materials and Structures)
2003 - 2008	Master's & Bachelor's (Dipl.-Ing.) in Physics (with highest distinction) Johannes Kepler University of Linz

Honors, Awards and Fellowships

Jan 2019	Ten robotics technologies of the year (the HASEL technology invented in the Keplinger Research Group is featured by the editors of <i>Science Robotics</i> ; DOI: 10.1126/scirobotics.aaw1826)
Dez 2018	Speaker at TEDxMileHigh: Reset (selected as a TEDx speaker for a live audience of 5000)
Jul 2018	Mollenkopf Faculty Fellowship (endowed position at the University of Colorado Boulder; awarded for outstanding research productivity)
Mar 2018	EAP-in-Action Best Demonstration Award 2018 (awarded for best technology demo at the SPIE Smart Structures and Materials conference, the leading conference for electroactive polymers)
Oct 2017	2017 Packard Fellowship for Science and Engineering (one of the most prestigious awards given to early-career scientists, this \$875,000.00 unrestricted award provides funding over 5 years "to think big and look at complex issues with a fresh perspective")
Jan 2014	Postdoctoral Award for Professional Development (from Harvard University)
Jun 2013	EAPromising European Researcher Award (for evidences of a promising career in the field of electroactive polymers; from the European Scientific Network for Artificial Muscles, ESNAM)
Nov 2012	Loschmidt Award (for outstanding dissertations; from the Chemical-Physical Society of Austria)
Oct 2012	Erwin Wenzl Award (for outstanding dissertations)
Dec 2011	Award of Excellence (from the Austrian Federal Ministry for Science and Research, BMWF)
Jul 2011	Award for Outstanding Young Scientists (from the Government of Upper Austria)
Sep 2009	Marshall Plan Scholarship (for a six-month research visit at Harvard University)
Apr 2009	Wilhelm Macke Award (best public presentation of master's thesis)
Sep 2008	Wilhelm Macke Master Thesis Prize (best master's thesis in Physics of the academic year)
Jul 2008	Academic Excellence Scholarship (from the Johannes Kepler University of Linz)

Publications

Citation Indices: **Google Scholar** <http://scholar.google.com/citations?user=spxYg2UAAAAJ&hl=en>
ResearcherID www.researcherid.com/rid/E-5553-2011

Peer Reviewer for:

Science, Science Robotics, Science Advances, Nature Materials, Nature Communications, Chemical Reviews, Angewandte Chemie International Edition, Advanced Materials, Advanced Functional Materials, Advanced Materials Technologies, Advanced Engineering Materials, Applied Physics Reviews, Applied Physics Letters, Materials Horizons, Soft Matter, ACS Macro Letters, Applied Physics A, NPG Asia Materials, IEEE/ASME Transactions on Mechatronics, IEEE Transactions on Robotics (T-RO), Energy Technology, Sustainability, Journal of Applied Physics, Smart Materials and Structures, ACS Applied Materials & Interfaces, npj Flexible Electronics, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), IEEE International Conference on Robotics and Automation (ICRA), IEEE Robotics and Automation Letters (RA-L), Extreme Mechanics Letters, Soft Robotics.

Journal Publications

- [27] Inkyu Oh, Christoph Keplinger, Jiayi Cui, Jiehao Chen, George M. Whitesides, Joanna Aizenberg, Yuhang Hu. "[Dynamically Actuated Liquid-Infused Poroelastic Film with Precise Control over Droplet Dynamics](#)". *Advanced Functional Materials* 28 (39), 1802632 (2018).
[PDF](#) | [Supplemental](#) | [Inside Front Cover](#)
- [26] Nicholas Kellaris, Vidyacharan Gopaluni-Venkata, Garrett M. Smith, Shane K. Mitchell, Christoph Keplinger. "[Peano-HASEL actuators: Muscle-mimetic, electrohydraulic transducers that linearly contract on activation](#)". *Science Robotics* 3 (14), eaar3276 (2018).
[PDF](#) | [Supplemental](#) | [Press, Video](#)
- [25] Eric Acome, Shane K. Mitchell, Timothy G. Morrissey, Madison B. Emmett, Claire Benjamin, Madeline King, Miles Radakovitz, Christoph Keplinger. "[Hydraulically amplified self-healing electrostatic actuators with muscle-like performance](#)". *Science* 359 (6371), 61-65 (2018).
[PDF](#) | [Supplemental](#) | [Press, Video](#)
- [24] Jin Adrian Koh, Christoph Keplinger, Rainer Kaltseis, Choon-Chiang Foo, Richard Baumgartner, Siegfried Bauer, Zhigang Suo. "[High-performance electromechanical transduction using laterally-constrained dielectric elastomers part I: Actuation processes](#)". *Journal of the Mechanics and Physics of Solids* 105, 81-94 (2017).
[PDF](#)
- [23] Yue Cao*, Timothy G. Morrissey*, Eric Acome, Sarah I. Allec, Bryan M. Wong, Christoph Keplinger+, Chao Wang+. "[A Transparent, Self-Healing, Highly Stretchable Ionic Conductor](#)". *Advanced Materials* 29 (10), 1605099 (2017).
(*Equal contribution; +Corresponding author)
[PDF](#) | [Supplemental](#) | [Press, Video](#)
- [22] Dian Yang, Mohit S. Verma, Ju-Hee So, Bobak Mosadegh, Christoph Keplinger, Benjamin Lee, Fatemeh Khashai, Elton Lossner, Zhigang Suo, George M. Whitesides. "[Buckling Pneumatic Linear Actuators Inspired by Muscle](#)". *Advanced Materials Technologies* 1 (3), 1600055 (2016).
[PDF](#) | [Supplemental](#) | [Press](#)

- [21] Cheng-Hui Li*, Chao Wang*, Christoph Keplinger, Jing-Lin Zuo, Lihua Jin, Yang Sun, Peng Zheng, Yi Cao, Franziska Lissel, Christian Linder, Xiao-Zeng You, Zhenan Bao. "[A highly stretchable autonomous self-healing elastomer](#)". *Nature Chemistry* 8 (6), 618-624 (2016). (*Equal contribution)
[PDF](#) | [Supplemental](#) | [Press](#), [Video](#)
- [20] Joshua Lessing, Stephen A. Morin, Christoph Keplinger, Alok S. Tayi, George M. Whitesides. "[Stretchable Conductive Composites Based on Metal Wools for Use as Electrical Vias in Soft Devices](#)". *Advanced Functional Materials* 25 (9), 1418-1425 (2015).
[PDF](#) | [Supplemental](#)
- [19] Jeong-Yun Sun*, Christoph Keplinger*, George M. Whitesides, Zhigang Suo. "[Ionic Skin](#)". *Advanced Materials* 26 (45), 7608-7614 (2014). (*Equal contribution)
[PDF](#) | [Supplemental](#)
- [18] Rainer Kaltseis, Christoph Keplinger, Soo Jin Adrian Koh, Richard Baumgartner, Yu Feng Goh, Wee Hoe Ng, Alexander Kogler, Andreas Tröls, Choon Chiang Foo, Zhigang Suo, Siegfried Bauer. "[Natural rubber for sustainable high-power electrical energy generation](#)". *RSC Advances* 4 (53), 27905-27913 (2014).
[PDF](#)
- [17] Joshua Lessing, Ana C. Glavan, S. Brett Walker, Christoph Keplinger, Jennifer A. Lewis, George M. Whitesides. "[Inkjet Printing of Conductive Inks with High Lateral Resolution on Omniphobic "RF Paper" for Paper-Based Electronics and MEMS](#)". *Advanced Materials* 26 (27), 4677-4682 (2014).
[PDF](#) | [Supplemental](#)
- [16] Ramses V. Martinez*, Ana C. Glavan*, Christoph Keplinger, Alexis I. Oyetibo, George M. Whitesides. "[Soft Actuators and Robots that Are Resistant to Mechanical Damage](#)". *Advanced Functional Materials* 24 (20), 3003-3010 (2014). (*Equal contribution)
[PDF](#) | [Supplemental](#)
- [15] Bobak Mosadegh, Panagiotis Polygerinos, Christoph Keplinger, Sophia Wennstedt, Robert F. Shepherd, Unmukt Gupta, Jongmin Shim, Katia Bertoldi, Conor J. Walsh, George M. Whitesides. "[Pneumatic Networks for Soft Robotics that Actuate Rapidly](#)". *Advanced Functional Materials* 24 (15), 2163-2170 (2014).
[PDF](#) | [Supplemental](#) | [Front Cover](#)
- [14] Tongqing Lu, Christoph Keplinger, Nikita Arnold, Siegfried Bauer, Zhigang Suo. "[Charge localization instability in a highly deformable dielectric elastomer](#)". *Applied Physics Letters* 104 (2), 022905 (2014).
[PDF](#)
- [13] Siegfried Bauer*, Simona Bauer-Gogonea*, Ingrid Graz*, Martin Kaltenbrunner*, Christoph Keplinger*, Reinhard Schwodiauer*. "[25th Anniversary Article: A Soft Future: From Robots and Sensor Skin to Energy Harvesters](#)". *Advanced Materials* 26 (1), 149-162 (2014). (*Equal contribution)
[PDF](#) | [Review Article](#)

- [12] Andreas Tröls, Alexander Kogler, Richard Baumgartner, Rainer Kaltseis, Christoph Keplinger, Reinhard Schwödiauer, Ingrid Graz, Siegfried Bauer. "[Stretch dependence of the electrical breakdown strength and dielectric constant of dielectric elastomers](#)". *Smart Materials and Structures* 22 (10), 104012 (2013).
[PDF](#)
- [11] Christoph Keplinger*, Jeong-Yun Sun*, Choon Chiang Foo, Philipp Rothmund, George M. Whitesides, Zhigang Suo. "[Stretchable, Transparent, Ionic Conductors](#)". *Science* 341 (6149), 984-987 (2013). (*Equal contribution)
[PDF](#) | [Supplemental](#) | [Press, Video, Perspective by John A. Rogers](#)
- [10] Tiefeng Li, Christoph Keplinger, Richard Baumgartner, Siegfried Bauer, Wei Yang, Zhigang Suo. "[Giant voltage-induced deformation in dielectric elastomers near the verge of snap-through instability](#)". *Journal of the Mechanics and Physics of Solids* 61 (2), 611-628 (2013).
[PDF](#)
- [9] Choon Chiang Foo, Soo Jin Adrian Koh, Christoph Keplinger, Rainer Kaltseis, Siegfried Bauer, Zhigang Suo. "[Performance of dissipative dielectric elastomer generators](#)". *Journal of Applied Physics* 111 (9), 094107 (2012).
[PDF](#)
- [8] Qibin Zhao, Andrew Haines, David Snoswell, Christoph Keplinger, Rainer Kaltseis, Siegfried Bauer, Ingrid Graz, Richard Denk, Peter Spahn, Goetz Hellmann, Jeremy J. Baumberg. "[Electric-field-tuned color in photonic crystal elastomers](#)". *Applied Physics Letters* 100 (10), 101902 (2012).
[PDF](#)
- [7] Christoph Keplinger, Tiefeng Li, Richard Baumgartner, Zhigang Suo, Siegfried Bauer. "[Harnessing snap-through instability in soft dielectrics to achieve giant voltage-triggered deformation](#)". *Soft Matter* 8 (2), 285-288 (2012).
[PDF](#) | [Front Cover](#)
- [6] Soo Jin Adrian Koh, Christoph Keplinger, Tiefeng Li, Siegfried Bauer, Zhigang Suo. "[Dielectric elastomer generators: How much energy can be converted?](#)". *IEEE/ASME Transactions on Mechatronics* 16 (1), 33-41 (2011).
[PDF](#)
- [5] Rainer Kaltseis, Christoph Keplinger, Richard Baumgartner, Martin Kaltenbrunner, Tiefeng Li, Philipp Maechler, Reinhard Schwödiauer, Zhigang Suo, Siegfried Bauer. "[Method for measuring energy generation and efficiency of dielectric elastomer generators](#)". *Applied Physics Letters* 99 (16), 162904 (2011).
[PDF](#)
- [4] Christoph Keplinger, Martin Kaltenbrunner, Nikita Arnold, Siegfried Bauer. "[Roentgen's electrode-free elastomer actuators without electromechanical pull-in instability](#)". *Proceedings of the National Academy of Sciences of the United States of America* 107 (10), 4505-4510 (2010).
[PDF](#) | [Supplemental](#)
- [3] Christoph Keplinger, Martin Kaltenbrunner, Nikita Arnold, Siegfried Bauer. "[Capacitive extensometry for transient strain analysis of dielectric elastomer actuators](#)". *Applied Physics Letters* 92 (19), 192903 (2008).
[PDF](#)

[2] Christian Metzger, Elgar Fleisch, Jan Meyer, Mario Dansachmueller, Ingrid Graz, Martin Kaltenbrunner, Christoph Keplinger, Reinhard Schwödauier, Siegfried Bauer. "[Flexible-foam-based capacitive sensor arrays for object detection at low cost](#)". *Applied Physics Letters* 92 (1), 013506 (2008).

[PDF](#)

[1] Ingrid Graz, Martin Kaltenbrunner, Christoph Keplinger, Reinhard Schwödauier, Siegfried Bauer, Stephanie P. Lacour, Sigurd Wagner. "[Flexible ferroelectret field-effect transistor for large-area sensor skins and microphones](#)". *Applied Physics Letters* 89 (7), 073501 (2006).

[PDF](#) | [Front Cover](#)

Conference Publications

[10] C. Schunk, L. Pearson, E. Acome, T.G. Morrissey, N. Correll, C. Keplinger, M.E. Rentschler, J.S. Humbert. (2018). System Identification and Closed-Loop Control of a Hydraulically Amplified Self-Healing Electrostatic (HASEL) Actuator. 2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 978-1-5386-8094-0, 6417-6423.

[9] T. Li, S. Qu, C. Keplinger, R. Kaltseis, R. Baumgartner, S. Bauer, Z. Suo, W. Yang. (2012). Modeling guided design of dielectric elastomer generators and actuators. *Electroactive Polymer Actuators and Devices (EAPAD) 2012, Proceedings of the SPIE 8340*, 83401X.

[8] T. Li, S. Qu, C. Keplinger, Z. Suo, W. Yang. (2012). Inhomogeneous deformation and instability in soft dielectric transducers. *Bulletin of the American Physical Society*, BAPS.2012.MAR.X49.1.

[7] R. Baumgartner, C. Keplinger, R. Kaltseis, R. Schwödauier, S. Bauer. (2011). Dielectric elastomers: From the beginning of modern science to applications in actuators and energy harvesters. *Electroactive Polymer Actuators and Devices (EAPAD) 2011, Proceedings of the SPIE 7976*, 797603.

[6] M. Kaltenbrunner, C. Keplinger, N. Arnold, S. Bauer. (2010). Electrode Free Elastomer Actuators with Unlimited Actuation Range. *Actuator 10, Conference Proceedings*, 427.

[5] T. Li, C. Keplinger, L. Liu, R. Baumgartner, S. Qu. (2010). Modeling of Inhomogeneous Deformation in a Dielectric Elastomer Generator for Energy Harvesting. *ASME 2010 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, Volume 1, SMASIS2010 3792*, 267.

[4] R. Schwödauier, I. Graz, M. Kaltenbrunner, C. Keplinger, P. Bartu, G. Buchberger, C. Ortwein, S. Bauer. (2008). Cellular ferroelectrets for soft matter integrated devices with advanced functionality. *2008 13th International Symposium on Electrets. ISE 13*, B1203.

[3] M. Kaltenbrunner, C. Keplinger, N. Arnold, S. Bauer. (2008). Analysis of safe and failure mode regimes of dielectric elastomer actuators. *Sensors, 2008 IEEE*, 156.

[2] R. Schwödauier, I. Graz, M. Kaltenbrunner, C. Keplinger, P. Bartu, G. Buchberger, C. Ortwein, S. Bauer. (2008). Cellular ferroelectrets for electroactive polymer hybrid systems: soft matter integrated devices with advanced functionality. *Electroactive Polymer Actuators and Devices (EAPAD) 2008, Proceedings of the SPIE 6927*, 69270Q-69270Q-10.

[1] S. Bauer, S. Bauer-Gogonea, M. Dansachmueller, G. Dennler, I. Graz, R. Schwoediauer, C. Keplinger, H. Reiss, N. Sariciftci, B. Singh, M. Kaltenbrunner. (2006). Piezoelectric polymers. *Materials Research Society Symposium Proceedings* 889, 0889-W01-02.1.

Other Publications

[9] Eric Acome, Nicholas Kellaris, Timothy Morrissey, Shane K. Mitchell, Christoph Keplinger. (2018). HASEL Artificial Muscles – Versatile High-performance Actuators for Next-Generation Robotics. *NASA JPL (NDEAA Lab) WorldWide ElectroActive Polymers Newsletter* 20 (1), 19.

[8] Eric Acome, Nicholas Kellaris, Timothy Morrissey, Shane K. Mitchell, Christoph Keplinger. (2018). Journal Club for February 2018: HASEL artificial muscles for high-speed, electrically powered, self-healing soft robots. *iMechanica Journal Club*, <http://imechanica.org/node/22096>

[7] Yue Cao, Timothy G. Morrissey, Eric Acome, Sarah I. Allec, Bryan M. Wong, Christoph Keplinger, Chao Wang. (2017). A Transparent, Self-Healing, Highly Stretchable Ionic Conductor. *NASA JPL (NDEAA Lab) WorldWide ElectroActive Polymers Newsletter* 19 (1), 16.

[6] Christoph Keplinger. (2011). Electromechanical Energy Conversion Using Dielectric Elastomers: Giant Voltage-Induced Deformation of Actuation and Renewable Energy Harvesting. *PhD Thesis (Dissertation)*, Johannes Kepler University of Linz. [Supervisor: Siegfried Bauer (Soft Matter Physics)]

[5] Siegfried Bauer, Christoph Keplinger. (2011). Dielectric-elastomer actuators deliver clean energy. *SPIE Newsroom*, DOI: 10.1117/2.1201102.003511. [<http://spie.org/x47448.xml>]

[4] Christoph Keplinger, Tiefeng Li, Richard Baumgartner, Zhigang Suo, Siegfried Bauer. (2011). Harnessing snap-through instability in soft dielectrics to achieve giant voltage-triggered deformation. *NASA JPL (NDEAA Lab) WorldWide ElectroActive Polymers Newsletter* 13 (2), 9.

[3] Christoph Keplinger, Martin Kaltenbrunner, Nikita Arnold, Siegfried Bauer. (2010). What can we learn by repeating the old experiment of Roentgen on charge controlled actuators? *NASA JPL (NDEAA Lab) WorldWide ElectroActive Polymers Newsletter* 12 (1), 13.

[2] Christoph Keplinger, Martin Kaltenbrunner, Nikita Arnold, Siegfried Bauer. (2008). Electrical control method for dielectric elastomer actuators. *NASA JPL (NDEAA Lab) WorldWide ElectroActive Polymers Newsletter* 10 (1), 10.

[1] Martin Kaltenbrunner, Christoph Keplinger. (2008). Dielektrische Elastomer Aktuatoren. *Master's Thesis (Diplomarbeit)*, Johannes Kepler University of Linz. [Supervisor: Siegfried Bauer (Soft Matter Physics)]

Patents

[4] Christoph Keplinger, Eric L. Acome, Nicholas A. Kellaris, Shane K. Mitchell, Madison B. Emmett. “**Hydraulically amplified self-healing electrostatic transducers**”, WO 2018/175741 A1.

[PDF](#)

- [3] Joshua A. Lessing, Ana C. Glavan, S. Brett Walker, Christoph Keplinger, George M. Whitesides. **“Cellulose and Cellulosic Substrate-Based Device”**, WO 2015/160684 A1.
[PDF](#)
- [2] Jeong-Yun Sun, Christoph Keplinger, Zhigang Suo, George M. Whitesides. **“Stretchable Ionics for Transparent Sensors and Actuators”**, WO 2014/169119 A1.
[PDF](#)
- [1] Siegfried Bauer, Ingrid Graz, Reinhard Schwoediauer, Christoph Keplinger, Martin Kaltenbrunner, Stephanie Lacour Perichon, Sigurd Wagner. **“Ferrous Component”**, WO 2007/085035 A2.
[PDF](#)

Invited/Keynote Talks, Conference Activities and Symposia Organized

Upcoming events:

- [39] 22nd International Conference on Solid State Ionics (SSI-22), 2019, Gangwon, Korea: TBD.
[Invited talk; member of the conference committee for “Ionics in soft materials, hydrogels”]
- [38] Summer School on Soft Robotics, Biomechanics and Advanced Human Machine Interaction, 2019, Dresden, Germany: TBD.
[Invited talk]
- [37] EuroEAP 2019 – Ninth international conference on Electromechanically Active Polymer (EAP) transducers & artificial muscles, 2019, Dresden, Germany: TBD.
[Invited talk]
- [36] “Land der Moeglichkeiten” (German for “A region of opportunity”) – large public event to discuss the future of Upper Austria, 2019, Linz, Austria: TBD.
[Keynote talk, invited by the Governor of Upper Austria; will also be attended by the Prime Minister of Austria]
- [35] Distinguished Lecture Series at Ecole Polytechnique Federale de Lausanne (EPFL), School of Engineering (IMT), 2019, Lausanne, Switzerland: TBD.
[Invited talk; Distinguished lecturer invitation is “only considered for the most highly recognized researchers and is established by recommendation only, a sign of the highest respect for your research activities among the experts in your field”]
- [34] Northwestern University - Physics Department Colloquium, 2019, Evanston, Illinois, USA: TBD.
[Invited talk]

Past events:

- [33] TEDxMileHigh: “Reset”, 2018, Denver, Colorado, USA: Artificial muscles for a new generation of lifelike robots.
[TEDx talk for live audience of 5000]
- [32] MIT Robotics Seminar, 2018, Boston, Massachusetts, USA: HASEL Artificial Muscles—Versatile High-Performance Actuators for a New Generation of Life-like Robots.
[Invited talk]
- [31] 2018 MRS Fall Meeting, 2018, Boston, Massachusetts, USA: HASEL Artificial Muscles—Versatile High-Performance Actuators for Next-Generation Robotics.
[Invited talk]

[30] Max Planck Institute for Intelligent Systems – Special Symposium on Intelligent Systems, 2018, Stuttgart, Germany: Intelligent Materials for a New Generation of life-like Robots.

[Keynote talk]

[29] Packard Fellows 30th Anniversary Reunion, 2018, San Diego, California, USA: HASEL Artificial Muscles – Versatile High-Performance Actuators for Next-Generation Robotics.

[Invited talk]

[28] International Union of Materials Research Societies – International Conference on Electronic Materials 2018 (IUMRS-ICEM 2018), 2018, Daejeon, Korea: Hydraulically Amplified Self-healing Electrostatic (HASEL) transducers: A new class of high-performance soft actuators.

[Invited talk]

[27] SPIE Smart Structures/NDE, Electroactive Polymer Actuators and Devices (EAPAD) XX, 2018, Denver, Colorado, USA: HASEL: Hydraulically amplified self-healing electrostatic actuators with muscle-like performance (*Live demo of the HASEL technology invented in the Keplinger Research Group*).

[Awarded with best of conference award: “EAP-in-Action Best Demonstration Award 2018”; session chair for “Modeling EAP Materials”; served as mentor at the “Lunch with the Experts - A Student Networking Event”]

[26] 2018 MRS Spring Meeting, 2018, Phoenix, Arizona, USA: Hydraulically Amplified Self-Healing Electrostatic (HASEL) Transducers—A New Class of Self-Sensing, High-Performance Artificial Muscles.

[Invited talk]

[25] Gordon Research Conference - Multifunctional Materials and Structures, 2018, Ventura, California, USA: Hydraulically Amplified Self-healing Electrostatic (HASEL) actuators: A new class of high-performance artificial muscles.

[24] CU on the Weekend (public lecture series), 2017, Boulder, Colorado, USA: How Renewable Technologies can Transform Energy.

[Public lecture]

[23] Invited Seminar, Department of Mechanical Engineering, Colorado State University, 2017, Fort Collins, Colorado, USA: Hydraulically Amplified Self-healing Electrostatic (HASEL) actuators: A new class of high-performance artificial muscles

[Invited talk]

[22] Invited Seminar, Department of Mechanical Engineering, National University of Singapore, 2017, Singapore: Hydraulically Amplified Self-Healing Electrostatic (HASEL) Actuators: High-Performance Muscle-Mimetic Transducers

[Invited talk]

[21] 9th International Conference on Materials for Advanced Technologies (ICMAT 2017, Symposium R, Wearable and Stretchable Electronics), 2017, Singapore: High Performance, Electrically Powered, Soft Actuators that Self-Heal.

[Invited talk; Session chair for “Stretchable Devices”]

[20] 9th International Conference on Materials for Advanced Technologies (ICMAT 2017, Symposium J, Transparent Electrode Materials and Devices), 2017, Singapore: Stretchable Ionics: From Transparent Artificial Muscles and Biocompatible Ionic Skin to Self-Healing Systems.

[Invited talk]

[19] 2017 MRS Spring Meeting, 2017, Phoenix, Arizona, USA: High Performance, Electrically Powered, Soft Actuators that Self-Heal.

[Symposium organizer of Symposium SM4: “A Soft Future—From Electronic Skin to Robotics and Energy Harvesting”]

[18] SPIE Smart Structures/NDE, Electroactive Polymer Actuators and Devices (EAPAD) XIX, 2017, Portland, Oregon, USA: Reliable, robust, electrically powered soft actuators that self-heal from mechanical and electrical damage.

[Invited talk; Session chair for "Electroactive Polymer Actuators"]

[17] SES2016, The 53rd Annual Technical Meeting of the Society of Engineering Science (SES), 2016, College Park, Maryland, USA

[Organizer of Symposium C-11: "Mechanics of Bioinspired Soft Machines"]

[16] 2nd UMD Workshop on Distributed Sensing, Actuation, and Control for Bio-inspired Soft Robotics, 2016, College Park, Maryland, USA:

Stretchable Ionics: From Transparent Artificial Muscles and Biocompatible Ionic Skin to Self-Healing Systems.

[Invited talk]

[15] 2016 MRS Spring Meeting, 2016, Phoenix, Arizona, USA:

Stretchable Ionics: From Transparent Artificial Muscles to Biocompatible Ionic Skin.

[Invited talk]

[14] 2015 MICT Training School on Dielectric Elastomer Transducers, 2015, EPFL, Neuchâtel, Switzerland:

Stretchable Ionics: Perfectly Transparent Artificial Muscles, Loudspeakers and Ionic Skin.

[Invited talk]

[13] 581. Wilhelm und Else Heraeus-Seminar on Flexible, Stretchable and Printable High Performance Electronics, 2015, Bad Honnef, Germany:

Stretchable Ionics: Perfectly Transparent Artificial Muscles, Loudspeakers and Ionic Skin.

[Invited talk]

[12] Ludwig Boltzmann Institute for Experimental and Clinical Traumatology, Institute Colloquium, 2014, Vienna, Austria:

Stretchable Ionics: Perfectly Transparent Artificial Muscles, Loudspeakers and Ionic Skin.

[Invited talk]

[11] SPIE Smart Structures/NDE, Electroactive Polymer Actuators and Devices (EAPAD) XVI, 2014, San Diego, USA:

Stretchable Ionics: Perfectly Transparent Artificial Muscles, Loudspeakers and Ionic Skin.

[Invited talk; Session chair for "Applications of EAP to optics" and for "General Applications of EAP Materials"]

[10] Stanford University, Mechanics and Computation Seminar, 2014, Stanford, USA:

Soft Machines: From Artificial Muscles and Renewable Energy to Stretchable Ionics and Bionic Skin.

[Invited talk]

[9] EuroEAP 2013, Third international conference on Electromechanically Active Polymer (EAP) transducers & artificial muscles, 2013, Zurich, Switzerland:

Giant deformation of elastomers in electric fields.

[Invited talk; Part of the "EAPromises Session" for young researchers with evidences of a promising career]

[8] Lecture Series of the Chemical-Physical Society of Austria, 2013, Vienna, Austria:

Elastomers in the Electric Field: Giant-Strain Actuators and Renewable Energy Harvesting.

[Invited talk; Introduction of recipients of the Loschmidt Award]

[7] ASME 2012 Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS), 2012, Stone Mountain, USA:

Dielectric Elastomers for Giant Voltage-Induced Deformation of Actuation and Renewable Energy Harvesting.

[Invited talk; Session organizer for "Multifunctionality of Electronic Electroactive Polymers"]

[6] SPIE Smart Structures/NDE, Electroactive Polymer Actuators and Devices (EAPAD) XIV, 2012, San Diego, USA:

Energy harvesting with dielectric elastomer generators based on natural rubber.

[Session chair for the session “Energy Harvesting”]

[5] SPIE Smart Structures/NDE, Electroactive Polymer Actuators and Devices (EAPAD) XIII, 2011, San Diego, USA:
Inflation of dielectric elastomer membranes for energy harvesting: prestretch, rupture, dielectric breakdown, and the electromechanical instability.

[4] 2010 MRS Spring Meeting, 2010, San Francisco, USA:
Aptitude of Dielectric Elastomer Transducers for Energy Harvesting Generators.

[3] 2009 MRS Spring Meeting, 2009, San Francisco, USA:
The Roentgen Experiment - A Historical Idea Opening up Interesting Possibilities for Dielectric Elastomer Actuator Design and Material Characterization.

[2] IEEE Sensors 2008, 2008, Lecce, Italy:
Analysis of safe and failure mode regimes of dielectric elastomer actuators.

[1] Winterschool on Organic Electronics, 2007, Plannersalm, Austria:
Multifunctional ferroelectric polymer – piezoelectric ceramic nano-composites for flexible skin-like electronics.

Teaching, Advising and Mentoring

- For a list of currently advised postdocs, PhD students, MS students, visiting scholars and undergraduate students, as well as group alumni, see: <http://www.keplingerresearchgroup.com/people>

Teaching at the University of Colorado Boulder:

Fall 2018	Soft Machines (MCEN-4064 and 5064) Teaching evaluation: Instructor overall: 5.6/6.0, Course overall: 5.4/6.0
Spring 2018	Mechanical Engineering Design Project 2 (MCEN-4085) Teaching evaluation: Instructor overall: 5.8/6.0, Course overall: 5.8/6.0
Fall 2017	Mechanical Engineering Design Project 1 (MCEN-4045)
Fall 2017	Engineering Projects (GEEN-1400) Teaching evaluation: Instructor overall: 5.7/6.0, Course overall: 5.4/6.0
Spring 2017	Special Topics in Mechanical Engineering: Soft Machines (MCEN-5228) Teaching evaluation: Instructor overall: 6.0/6.0, Course overall: 5.8/6.0
Fall 2016	Engineering Projects (GEEN-1400) Teaching evaluation: Instructor overall: 5.6/6.0, Course overall: 5.3/6.0
Spring 2016	Special Topics in Mechanical Engineering: Soft Machines (MCEN-5228) Teaching evaluation: Instructor overall: 5.8/6.0, Course overall: 5.5/6.0
Fall 2015	Engineering Projects (GEEN-1400) Teaching evaluation: Instructor overall: 5.8/6.0, Course overall: 5.6/6.0

Teaching prior to joining the faculty at Boulder:

Mar 2009 - Jun 2009	Lecturer of Polymer Physics Exercises , Johannes Kepler University of Linz.
Mar 2006 - Jan 2009	Tutorials for the courses Experimental Physics I-IV , Tutorial for the course Physics in Biological Chemistry , Tutorial for the course Physics for Mechatronics Engineers , Laboratory tutorial Soft Matter Physics I , all at the Johannes Kepler University of Linz.

2002 - 2008

Private lessons for high school students in mathematics, physics and Latin; **Course instructor at summer schools** (high school level) in mathematics and Latin.

Skills and Interests

- **Languages:** German (native), English (fluent), Latin (very good), Russian (good), French (good), Spanish (basic).
- **Photography, badminton, violin**