

Curriculum Vitae



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My main scientific interests are in problems of plasma astrophysics, especially solar and heliospheric physics, from an observational and experimental point of view. Studying the Sun and the heliosphere has an essential advantage over studying other astrophysical objects in that detailed spatially resolved observations and even in-situ observations can be made. Over the past 18 years, I have been working on problems of how the solar corona is heated, how magnetic energy is converted, how energetic particles are accelerated and how they escape from acceleration sites into interplanetary space. During this time I have published 116 papers in refereed journals addressing these problems (h index of 30), 25 as a first author.

Most of the recent advances in our understanding of solar flare physics have been provided by space instrumentations. It is therefore essential to be closely involved in or to lead future space hardware projects. I am heavily involved in the planning and designing of space missions. I am Principal Investigator (PI) of both a successfully flown NASA sounding rocket mission called FOXSI, and the Spectrometer/Telescope for Imaging X-rays (STIX) on ESA's Solar Orbiter.

I currently have a double appointment evenly shared at the University of Applied Sciences Northwestern Switzerland (FHNW) and the Space Sciences Laboratory, University of California, Berkeley, USA. At FHNW, I am working on the STIX project as the PI. At Berkeley, I have a Senior Fellow position that allows me to have my own research group. I am or have been closely involved in the supervision of five graduate students, I have hired and instructed several undergraduate students, and I have been mentoring 11 postdoctoral scientists.

Presently my scientific work is divided between

- (1) Planning, designing, and managing of spacecraft instrumentation,
- (2) Data analysis of various remote sensing solar observations and spacecraft in-situ observations of solar energetic particles; and
- (3) Mentoring undergraduate, graduate, and postdoctoral scientists.

Professional Status

2011: Faculty at University of Applied Sciences Northwestern Switzerland
2010: double appointment at and the University of Applied Sciences Northwestern Switzerland and the Space Sciences Laboratory, University of California at Berkeley
2008-2010: Head of space allocation committee at the Space Sciences Laboratory
2008: Member of the executive committee to the director of the Space Sciences Laboratory
2006 to present: Senior Fellow at the Space Sciences Laboratory, UC Berkeley
2000-2006: Research physicist at the Space Sciences Laboratory
1999-2000: Extension of fellowship of the Swiss National Science Foundation (2 years)
1998: Fellowship of the Swiss National Science Foundation awarded (1 year)
1997-2000: Post-doctorate position at the Space Sciences Laboratory, University of California, Berkeley (with Prof. R. P. Lin)

Education

1996: PhD Thesis: "Small Solar Flares in Radio and X-rays: Microflares and Radio Bursts"
1993-1996: PhD student at the Institute of Astronomy, ETH Zürich (Prof. A. O. Benz)
1992: Diploma in experimental physics (Masters Degree), ETH Zürich
Diploma thesis in Quantum Electronics: "Investigations on Photorefractive KNbO₃ in the Red and Near Infrared" (supervisor Prof. P. Günter)
1987-1992: Study of experimental physics, ETH Zürich, Switzerland

Experience

Planning, design, and calibration of spacecraft instrumentation

- PI of the STIX instrument on ESA's Solar Orbiter mission (to be launch in 2017)
- PI of NASA sounding rocket experiment (FOXSI, successfully launched on Nov 2, 2012)
- Testing and calibration of hard X-ray focusing optics
- RHESSI imager testing in collaboration with the Paul Scherrer Institute, Switzerland
- Studies for future space instrumentation, in particular for inner heliospheric missions (Solar Probe Plus, Sentinels) and for hard X-ray imaging spectroscopy missions (SPARKS, SEE2020, RAM)

Data analysis and interpretation of solar observations:

- X-ray and gamma ray observations with RHESSI
- Spectral and imaging radio observations of the Sun
- In-situ observations of solar particle events detected in interplanetary space (WIND/3dp).
- Furthermore, I have extensive experience in observation and data analysis with the following instruments: VLA, Yohkoh SXT, Hinode XRT, EIT, STEREO/SECCHI, CDS, SUMER, TRACE, GOES/SXI, Ulysses/GRB, SDO, particle detectors on ACE, SOHO, and Ulysses, radio observations with WIND/WAVES and STEREO/WAVES
- Software development in IDL for data analysis in particular for the RHESSI mission

Many years of experience in instructing students:

- Regularly hire and supervise undergraduate students, working together on scientific data analysis projects and hardware projects
- At Berkeley, have been closely involved in the supervision of 5 graduate students
- Over the past 10 years, have mentored 11 Postdoctoral Fellows
- Have given lectures at summer schools in both Europe and the USA

International scientific reputation:

- Published 116 refereed papers in international journals, 25 as a first author (h-index of 30)
- Given 41 invited talks over the past 10 years
- Scientific organizer of international meetings and workshops
- Worldwide scientific collaborations

Co-Investigator and Principle Investigator on the following space missions

2012: PI of STIX onboard ESA's Solar Orbiter mission

2011: Member of the NuSTAR science team

2010: Co-I of FIELDS instrument suite onboard the NASA mission SOLAR PROBE+

2008: Deputy PI of STIX onboard ESA's Solar Orbiter mission

2007: PI of NASA low cost access to space sounding rocket mission (FOXSI)

2006: Co-I of SWAVES instrument on the NASA mission STEREO

2003: Co-I of the NASA small explorer mission RHESSI

External Funding as PI

2012-2015: Swiss National Science Foundation (NuSTAR solar science)	sFr 436,375
2012-2017: Swiss PRODEX funding for STIX	€ 13,600,000
2012-2015: NASA Heliospheric SR&T (radio and HXR from CMEs)	\$352,977
2011-2014: NASA Low Cost Access to Space (FOXSI update)	\$937,100
2007-2011: NASA Low Cost Access to Space (FOXSI)	\$1,740,000
2007-2009: NASA guest investigator proposal (Impulsive electron events)	\$131,400
2005-2006: NASA guest investigator proposal (coronal heating)	\$124,400
2004-2005: France-Berkeley Fund (Origin of solar energetic particles)	\$10,000
2002-2003: NASA Heliospheric SR&T (CMEs & SEPs)	\$55,300
1997-2000: Swiss Science Foundation (Origin of solar energetic particles)	sFr 116,000

Invited Talks at international conferences (since 2002)

1. FASR workshop, Green Bank, WV, USA, May 2002, "Coronal heating and microbursts"
2. American Geophysical Union (AGU) spring meeting, Washington, DC, USA, May 2002, "X-ray signatures related to energetic electrons escaping from the Sun: First RHESSI results"
3. Solar Physics Division (SPD) Meeting, Albuquerque, NM, USA, June 2002, "X-ray Imaging spectroscopy with RHESSI: first results"
4. 34th COSPAR Scientific Assembly, Houston, TX, USA, October 2002, "Understanding of Particle Acceleration from in situ Electron Measurements"
5. Solar Imaging Radio Array (SIRA) workshop, Lanham, MD, USA, May 2003, "SEPs and Solar Radio Bursts"
6. IUGG 2003 General Assembly, Sapporo, Japan, June 2003, "Recent results from RHESSI"
7. IUGG 2003 General Assembly, Sapporo, Japan, June 2003, "Microflare heating"
8. American Geophysical Union AGU Fall Meeting, San Francisco, CA, USA, December 2003, "Flare activity during the October/November storms"
9. American Geophysical Union (AGU) spring meeting, Montreal, Canada, May 2004, "Flare activity during the October/November storms"
10. Solar Physics Division (SPD) meeting, Denver, CO, USA, May 2004, "RHESSI observations during the Halloween events 2003"
11. SHINE Workshop, Big Sky, MT, USA, June 2004, "Solar particle acceleration and their escape into interplanetary space"
12. Cool Stars Workshop 13, Hamburg, Germany, July 5-9, 2004, "New insights into solar physics from RHESSI"
13. 35th COSPAR Scientific Assembly and Associated Events, Paris, France, July 2004, "Impulsive electron events seen at 1 AU and their solar origin: a review of recent results"
14. SoHO 15 workshop, University of St. Andrews, St. Andrews, Scotland, UK, September 2004, "Overview of RHESSI results:"
15. Nobeyama Symposium, Kiyosato, Japan, October 2004, "Radio and RHESSI X-ray observations"
16. "X-ray Workshop: X-rays from Young Stars, the Sun, and Compact Systems", Taipei, Taiwan, December 16-17, 2004, "Solar X-ray and Gamma-ray observations"
17. Magnetic Reconnection meeting 2005, "Astrophysical Reconnection and Particle Acceleration", March 8-10, 2005, Awajishima Island, Japan, "Observations of Solar Flares with RHESSI"
18. Nobeyama workshop, Nobeyama, Japan, August 22-26, 2005, "RHESSI X-ray and radio observations"
19. The European Union Research Training Network on Turbulence in Space Plasmas - Theory, Observation and Simulation, Castello di Montegufoni, Italy, October 3-7, 2005, "Diagnostics of solar particle acceleration"
20. STEREO-Solar-B workshop, Turtle Bay, Hawaii, November 15-18, 2005, "Combined RHESSI-Yohkoh-Trace-WIND studies"
21. American Geophysical Union AGU Fall Meeting, San Francisco, CA, USA, December 2005, "RHESSI X-ray and Gamma-ray observations of the January 20, 2005 event"
22. ILWS Workshop, Goa, India, February 20-24, 2006, "Solar flare imaging"
23. Shine workshop, Midway, UT, USA, July 31 - August 4, 2006, "Where can shocks form in the solar corona: X-ray observations"
24. CESRA workshop, Ioannina, Greece, June 12 - 16, 2007, "Solar energetic particles, flares and CMEs - present status and STEREO perspective"

25. Shine workshop, Whistler, BC, Canada, July 30 - August 3, 2007, "Observations of electron beams in the solar corona: X-ray, radio, and in-situ observations"
26. International Astronomical Union Symposium 247, Porlamar, Isla de Margarita, Venezuela, September 17-22, 2007, "Electron acceleration in solar flares: X-ray and in-situ electron observations"
27. 1st SMESE Workshop, Paris, France, March 10-12, 2008, "Hard X-ray Emission from the Solar Corona"
28. Shine workshop, Midway, UT, USA, June 23 - June 28, 2008, "Hard X-rays and type III radio bursts"
29. Shine workshop, Midway, UT, USA, June 23 - June 28, 2008, "Coronal hard X-ray emissions associated with Coronal Mass Ejections"
30. 8th RHESSI Workshop, Potsdam, Germany, September 2-6, 2008, "Hard X-Ray and Gamma-Ray Sources, and their relation to CMEs and SEPs"
31. 3rd Solar Orbiter Workshop, Sorrento, May 25-28, 2009, "Investigate the links between the solar surface, corona and inner heliosphere"
32. THESIS Workshop, Moscow, Russia, October 19 - 23, 2009, "Hard X-ray focusing optics for solar observations"
33. FISFES Workshop, Tainan, Taiwan, November 30 - December 2, 2009, "Hard X-ray observations of solar flares"
34. ISSI Workshop on 'Multi-scale physics in coronal heating and solar wind acceleration', Bern, Switzerland, January 25-29, 2010, "Hard X-ray observations of partially disk occulted solar flares"
35. Yosemite workshop on magnetic reconnection, February 8-12, 2010, "Particle acceleration in impulsive solar flares"
36. EGU meeting, Vienna, Austria, in session 'Magnetic Topology and Energetic Particles in the Solar System', May 5, 2010, "Solar Flare Electrons at the Sun and in the Interplanetary Space"
37. ISSI workshop on Particle Acceleration in Cosmic Plasmas, Bern, Switzerland, 16-20 May 2011, "Flare observations"
38. SPIE Astronomical Telescopes + Instrumentation, Amsterdam, July 1-4, 2012, "The Focusing Optics Solar Hard X-ray Imager (FOXSI)"
39. Twenty Years of Nobeyama Radioheliograph and Beyond, Nagoya, Japan, 20-23 November 2012, "RHESSI observations of coronal HXR emissions"
40. International Workshop on Astronomical X-ray Optics, Prague, Dec 10-13, 2012, "The Focusing Optics Solar Hard X-ray Imager (FOXSI)"
41. CMSO workshop on particle energization, Madison, Dec 17-19, 2012, "Energetic Electrons in Solar Flares"

Additionally, at least as many contributed presentations were given at numerous scientific meetings.

During the same time period, seminars were given at the following institutions:

University of California, Berkeley; Lockheed Martin Advanced Technology Center, Palo Alto; UC Santa Cruz, Santa Cruz; UCLA; University of Arizona, Tucson; University of Michigan, Ann Arbor; NASA Goddard Space Flight Center, Maryland; Harvard-Smithsonian Center for Astrophysics, Cambridge, MA; Applied Physics Laboratory, Laurel, Maryland; ETH Zürich, Switzerland; University of Bern, Switzerland; Physikalisch-Meteorologisches Observatorium Davos, Switzerland; Observatoire de Paris, Meudon, France; Astrophysical Institute Potsdam, Germany; Christian-Albrechts-Universität zu Kiel, Germany; Osservatorio Astronomico di Brera, Italy; University of Glasgow, UK; Mullard Space Flight Center, UK; Aristotle University of Thessaloniki, Greece; Moscow State University, Moscow, Russia; National Central University, Jhongli, Taiwan; Nagoya University, Japan; Kyoto University, Japan; Tokyo University, Japan; and Purple Mountain Observatory, Nanjing, China.

Organizer of Meetings and Workshops

1. Working group leader at the ACE-RHESSI-WIND workshop in Taos, New Mexico, USA, Oct 7-9, 2003
2. Working group leader at the RHESSI-SOHO-TRACE workshop in Sonoma, California, Dec 8-11, 2004
3. Co-organizer of Special Session on 'Solar Energetic Particles: How Much Injection Delay, How Much Propagation Scattering?', American Geophysical Union meeting in Baltimore, USA, May 23-26, 2006
4. Organizer of the RHESSI-NESSI workshop series on 'X-ray Imaging Spectroscopy', Paris, France, April 3-4, 2006; and Berkeley, USA, November 6-8, 2006
5. Team leader of workshop on 'Coronal X-ray sources' at the International Space Science Institute, Bern, Switzerland, October 3-6, 2006 and May 8-11, 2007
6. Co-organizer of Special Session on 'Particle Acceleration and Transport in the Sun and Interplanetary Space' at the American Geophysical Union meeting in Fort Lauderdale, USA, May 27-30, 2008
7. Working group leader at the SHINE meeting, 'HXRs and Particle Acceleration', Midway, UT, June 23-28, 2008
8. Member of the organizing Committee of the conference "Solar activity during the onset of Solar Cycle 24", Napa, USA, 7-12 December 2008
9. Working group leader at 9th RHESSI workshop, Genoa, Italy, September 1-5, 2009
10. Team leader of ISSI international team on 'Submillimeter Solar Flare Observations', November 9-11, 2009 and June 9-11, 2010
11. Working group leader at 10th RHESSI workshop, Annapolis, Maryland, USA, August 1-5, 2010
12. Scientific Organization Committee for 4th Solar Orbiter workshop, Telluride, USA, March 27-31, 2011
13. Scientific Organization Committee for 5th Solar Orbiter workshop, Brugge, Belgium, September 10-14, 2012
14. AGU session SH05: "Solar Flares in the Rising Phase of Solar Cycle 24", San Francisco, USA, Dec 3-7, 2012

Publications (papers in refereed journals)

1. Säm Krucker & Arnold O. Benz: *The frequency ratio of bands of microwave spikes during solar flares*, *Astronomy & Astrophysics*, 285, 1038, 1994
2. C. Medrano, M. Zgonik, N. Sonderer, Ch. Beyeler, Säm Krucker, J. Seglins, H. Wüest, and P. Günter: *Photorefractive effect in Cu- and Ni-doped KNbO₃ in the visible and near infrared*, *Journal of Applied Physics*, 76, Issue 10, pp. 5640-5645, 1994
3. Säm Krucker, Markus J. Aschwanden, Tim S. Bastian & Arnold O. Benz: *First VLA observation of a solar narrowband, millisecond spike event*, *Astronomy & Astrophysics* 302, 551, 1995
4. Säm Krucker, Arnold O. Benz, Markus J. Aschwanden & Tim S. Bastian: *Location of type-I radio continuum and bursts on Yohkoh soft X-ray maps*, *Solar Physics* 160, 151, 1995
5. Säm Krucker, Arnold O. Benz & Markus J. Aschwanden: *Yohkoh observation of the source regions of solar narrowband, millisecond spike events*, *Astronomy & Astrophysics*, 317, 569, 1997
6. Arnold O. Benz, Säm Krucker, Loren W. Acton & Tim S. Bastian: *Fine structure of the X-ray and radio emission of the quiet solar corona*, *Astronomy & Astrophysics*, 320, 993, 1997
7. Säm Krucker, Arnold O. Benz, Tim S. Bastian & Loren W. Acton: *X-ray and radio microflares in the magnetic network of the quiet Sun*, *Astrophysical Journal*, 488, 499, 1997
8. Arnold O. Benz & Säm Krucker: *Heating Events in the Quiet Solar Corona*, *Solar Physics*, 182, 349, 1998
9. Säm Krucker & Arnold O. Benz: *Energy Distribution of Heating Processes in the Quiet Solar Corona*, *Astrophysical Journal*, 501, L213, 1998
10. S. D. Bale, M. J. Reiner, J.L. Bougeret, M. L. Kaiser, Säm Krucker, D. E. Larson, & R. P. Lin: *The Source Region of an Interplanetary Type II Radio burst*, *Geophys. Res. Letters*, 26, 1573, 1999
11. Arnold O. Benz & Säm Krucker: *Heating Events in the Quiet Solar Corona: multiwavelength correlations*, *Astronomy and Astrophysics*, 341, 286, 1999
12. Säm Krucker, Robert P. Lin, Davin E. Larson & Barbara J. Thompson: *On the Origin of Impulsive Electron Events Observed at 1~AU*, *Astrophysical Journal*, 519, 864, 1999
13. Säm Krucker, Robert P. Lin: *Two Classes of Solar Proton Events Derived from Onset Time Analysis*, *Astrophysical Journal Letters*, 542, L61, 2000
14. Brown, J. C.; Krucker, S.; Güdel, M.; Benz, A. O.: *Mechanisms for dynamic coronal mass supply via evaporative solar micro-events*, *Astronomy and Astrophysics*, 359, 1185, 2000
15. Säm Krucker & Arnold O. Benz: *Are Heating Events in the Quiet Solar Corona Small Flares? - Multiwavelength Observations of Individual Events*, *Solar Physics*, 191, 341, 2000
16. Benz, Arnold O.; Lin, Robert P.; Sheiner, Olga A.; Krucker, Säm; Fainberg, Joe: *The Source Regions of Impulsive Solar Electron Events*, *Solar Physics*, 203, 131, 2001
17. Maia, Dalmiro; Pick, Monique; Hawkins, S. Edward, III; Krucker, Säm: *Solar Origin of a Series of Well-collimated Electron Events*, *Astrophysical Journal*, 560, 1068, 2001
18. A. Klassen, V. Bothmer, G. Mann, M. Reiner, Säm Krucker, A. Vourlidas, H. Kunow: *Solar energetic electron events and coronal shocks*, *Astronomy and Astrophysics*, 385, 1078, 2002
19. Bieber, J.W.; Dröge, W.; Evenson, P.A.; Pyle, R.; Ruffolo, D.; Pinsook, U.; Tooprakai, P.; Rujjwarodom, M.;Khumlumlert, T.; Krucker, Säm: *Energetic Particle Observations*

- during the 2000 July 14 Solar Event*, *Astrophysical Journal*, 567, 622, 2002
20. Benz, Arnold O.; Krucker, Säm: *Energy Distribution of Microevents in the Quiet Solar Corona*: *Astrophysical Journal*, 568, 413, 2002
 21. Lin, R.P. and 67 co-authors: *The Reuven Ramaty High Energy Solar Spectroscopic Imager (RHESSI)*, *Solar Physics* 210, 3, 2002
 22. Hurford, G.H. and 13 co-authors: *The RHESSI Imaging Concept*, *Solar Physics* 210, 61-86, 2002
 23. Peter Gallagher, Brian Dennis, Säm Krucker, Richard Schwartz, Kimberly Tolbert: *RHESSI and TRACE observations of the 21 April 2002 X1.5 flare*, *Solar Physics* 210, 341-356, 2002
 24. Linhui Sui, Gordon Holman, Brian Dennis, Säm Krucker, Richard Schwartz, Kimberly Tolbert: *Modeling Images and Spectra of a Solar Flare Observed by RHESSI on 20 February 2002*, *Solar Physics* 210, 245-259, 2002
 25. Nicole Vilmer, Säm Krucker, Robert P. Lin: *Hard X-ray and metric/decimetric radio observations of the 20 February 2002 solar flare*, *Solar Physics* 210, 261, 2002
 26. Säm Krucker & Robert P. Lin: *Relative Timing and Spectra of Solar Flare Hard X-ray Sources*, *Solar Physics* 210, 229, 2002
 27. Säm Krucker, Steven Christe, Robert P. Lin, Gordon Hurford, Richard Schwartz: *Hard X-ray Microflares down to 3~keV*, *Solar Physics* 210, 445, 2002
 28. Dalla, S.; Balogh, A.; Krucker, Säm; Posner, A.; Müller-Mellin, R.; Anglin, J. D.; Hofer, M. Y.; Marsden, R. G.; Sanderson, T. R.; Tranquille, C.; Heber, B.; Zhang, M.; McKibben, R. B.: *Properties of high heliolatitude solar energetic particle events and constraints on models of acceleration and propagation*, *Geophysical Research Letters*, 30, 8035, 2003
 29. Gimenez de Castro, C. G.; Silva, A. V. R.; Trottet, G.; Costa, J. E. R.; Kaufman, P.; Correia, E.; Krucker, Säm; Martinez, G.; Rovira, M.; Lüthi, T.; Magun, A.; Levato, H.: *A multiwavelength analysis of the August 30, 2002 flare*, *Boletim da Sociedade Astronômica Brasileira*, 23, 23, 2003
 30. Säm Krucker: *On the origin of solar energetic particles*, *Lecture notes in Physics*, 179-192, 2003
 31. Klein, K.L., Krucker, Säm, and Trottet, G.: *WIND/3DP and Nancay radioheliograph observations of solar energetic electron events*, *Advances in Space Research*, Volume 32, Issue 12, p. 2521, 2003
 32. Vilmer, N.; Krucker, S.; Trottet, G.; Lin, R. P.: *Hard X-ray and metric/decimetric spatially resolved observations of the 10 April 2002 solar flare*, *Advances in Space Research*, 32, 2509, 2003
 33. Emslie, A.G., Kontar, E.P., Krucker, Säm, and Lin, R.P.: *RHESSI Hard X-ray Imaging Spectroscopy of the Large Gamma-Ray Flare of July 23, 2002*, *ApJL*, 595, L107, 2003
 34. White, S.M., Krucker, Säm, Shibasaki, K., Yokoyama, T., Shimojo, M., and Kundu, M.R.: *Radio and hard X-ray images of high-energy electrons in a compact X-class solar flare*, *ApJL*, 595, L111, 2003
 35. Hurford, G.J., Schwartz, R.A., Krucker, S., Lin, R.P., Smith, D.M., and Vilmer, N.: *First gamma-ray images of a solar flare*, *ApJL*, 595, L77, 2003
 36. Lin, R.P., Krucker, S., and 11 coauthors.: *RHESSI Observations of Particle Acceleration and energy Release in an Intense Solar Gamma-Ray Line Flare*, *ApJL*, 595, L69, 2003
 37. Säm Krucker, Hurford, G.J., and Lin, R.P.: *Hard X-ray Source Motions in the July 23, 2002 Gamma-ray Flare*, *ApJL*, 595, L103, 2003
 38. Karlicky, M.; Farnik, F.; Krucker, Säm: *High-frequency slowly drifting structures and X-ray sources observed by RHESSI*, *Astronomy and Astrophysics*, 419, 365, 2004
 39. Yurchyshyn, Vasyl; Wang, Haimin; Abramenko, Valentyna; Spirock, Thomas J.; Krucker, Säm: *Magnetic Field, $H\alpha$, and RHESSI Observations of the 2002 July 23 Gamma-Ray*

- Flare*, *Astrophysical Journal*, 605, 546, 2004
40. Liu, Chang; Qiu, Jiong; Gary, Dale E.; Krucker, Säm; Wang, Haimin: *Studies of Microflares in RHESSI Hard X-Ray, Big Bear Solar Observatory H, and Michelson Doppler Imager Magnetograms*, *Astrophysical Journal*, 604, 442, 2004
 41. Aschwanden, M.J.; Metcalf, T.R.; Krucker, Säm; Sato, J.; Conway, A.J.; Hurford, G.J.; Schmahl, E.J.: *On the Photometric Accuracy of RHESSI Imaging and Spectroscopy*, *Solar Physics*, 219, 149, 2004
 42. Kundu, M. R.; Garaimov, V. I.; White, S. M.; Krucker, Säm: *Nobeyama Radioheliograph and RHESSI Observations of the X1.5 Flare of 2002 April 21*, *Astrophysical Journal*, 600, 1052, 2004
 43. Gopalswamy, N.; Yashiro, S.; Krucker, Säm; Stenborg, G.; Howard, R. A.: *Intensity variation of large solar energetic particle events associated with coronal mass ejections*, *Journal of Geophysical Research*, Volume 109, Issue A12, CiteID A12105, 2004
 44. Klein, K. L.; Krucker, Säm; Trottet, G.; Hoang, S.: *Coronal phenomena at the release of solar energetic electron events*, *Astronomy & Astrophysics*, 431, 1047, 2005
 45. Pick, M.; Demoulin, P.; Krucker, Säm; Malandraki, O.; Maia, D.: *Radio and X-Ray Signatures of Magnetic Reconnection behind an Ejected Flux Rope*, *Astrophysical Journal*, 625, 1019, 2005
 46. Hurley, K.; Boggs, S. E.; Smith, D. M.; Duncan, R. C.; Lin, R.; Zoglauer, A.; Krucker, Säm; Hurford, G.; Hudson, H.; Wigger, C.; and 10 coauthors: *An exceptionally bright flare from SGR 1806-20 and the origins of short-duration gamma-ray bursts*, *Nature*, 434, 1098, 2005
 47. Dauphin, C.; Vilmer, N.; Lüthi, T.; Trottet, G.; Krucker, Säm; Magun, A.: *Modulations of broad-band radio continua and X-ray emissions in the large X-ray flare on 03 November 2003*, *Advance in Space Research*, 35, Issue 10, 1805, 2005
 48. Klassen, A.; Krucker, Säm; Kunow, H.; Müller-Mellin, R.; Wimmer-Schweingruber, R.; Mann, G.; Posner, A.: *Solar energetic electrons related to the 28 October 2003 flare*, *JGRA*, Volume 110, Issue A9, CiteID A09S0, 2005
 49. Säm Krucker, M.D. Fivian & Robert P. Lin: *Hard X-ray footpoint motions in solar flares: comparing magnetic reconnection models with observations*, *Advance in Space Research*, 35, Issue 10, 1707, 2005
 50. Wang, L., Lin, R.P., Säm Krucker, Gosling, J.T.: *Evidence for double injections in scatter-free solar impulsive electron events*, *Geophysical Research Letters*, Volume 33, Issue 3, CiteID L03106, 2006
 51. Dauphin, C.; Vilmer, N.; Krucker, Säm: *Observations of a soft X-ray rising loop associated with a type II burst and a coronal mass ejection in the 03 November 2003 X-ray flare*, *Astronomy and Astrophysics*, 455, 339, 2006
 52. Hurford, G. J.; Krucker, Säm; Lin, R. P.; Schwartz, R. A.; Share, G. H.; Smith, D. M.: *Gamma-Ray Imaging of the 2003 October/November Solar Flares*, *The Astrophysical Journal*, 644, L93, 2006
 53. Yan, Y.; Pick, M.; Wang, M.; Säm Krucker; Vourlidas, A.: *A Radio Burst and Its Associated CME on March 17, 2002*, *Solar Physics* 239, 239, 2006
 54. Reiner, M. J., Säm Krucker; Gary, D. E.; Dougherty, B. L.; Kaiser, M. L.; Bougeret, J.-L.: *Radio and White-Light Coronal Signatures Associated with the RHESSI Hard X-Ray Event of 2002 July 23*, *The Astrophysical Journal*, 657, 1107, 2007
 55. Säm Krucker, E.P. Kontar & Robert P. Lin: *Solar Flare Electron Spectra at the Sun and near the Earth*, *The Astrophysical Journal*, 663, L109, 2007
 56. Kartavykh, W. Droege, B. Klecker, G. M. Mason, E. Moebius, M. Popecki, and Säm Krucker: *Evidence for a Two-Temperature Source Region in the 3He-Rich Solar*

- Energetic Particle Event of 2000 May 1*, The Astrophysical Journal, 671, 947, 2007
57. Säm Krucker, S.M. White, & Robert P. Lin: *Solar Flare Hard X-ray Emission from the High Corona*, The Astrophysical Journal Letters, 669, 49, 2007
58. Säm Krucker, I.G. Hannah, & Robert P. Lin: *RHESSI and Hinode X-ray Observations of a Partially Occulted Solar Flare*, The Astrophysical Journal Letter, 671, L193, 2007
59. Säm Krucker & Robert P. Lin: *Hard X-ray emissions from partially occulted flares*, The Astrophysical Journal, 673, 1181, 2008
60. Saldanha, Säm Krucker, & Robert P. Lin: *Hard X-ray Spectral Evolution and Production of Solar Energetic Particle Events during the January 2005 X-class Flares*, The Astrophysical Journal, 673, 1169, 2008
61. J.-L. Bougeret and 42 co-authors: *The Radio and Plasma Wave Investigation on the STEREO Mission*, Space Science Reviews, 10.1007/s11214-007-9298-8, 2008
62. N. V. Nitta, G.M Mason, M.E. Wiedenbeck, C.M.S. Cohen, Säm Krucker, I.G. Hannah, M. Shimojo, K. Shibata: *Coronal Jet Observed by Hinode as the Source of a 3He-rich Solar Energetic Particle Event*, The Astrophysical Journal Letters, 675, L125, 2008
63. I.G. Hannah, Säm Krucker, H.S. Hudson, S. Christe, S., R.P. Lin: *An intriguing solar microflare observed with RHESSI, Hinode, and TRACE*, Astronomy and Astrophysics, 481, L45, 2008
64. S. Christe, I.G. Hannah, Säm Krucker, J. McTiernan & Robert P. Lin: *RHESSI microflare Statistics: I. Flare Finding and Frequency Distribution*, The Astrophysical Journal, 677, 1385, 2008
65. I.G. Hannah, S. Christe, Säm Krucker, G.D. Hurford, H.S. Hudson, & Robert P. Lin: *RHESSI microflare Statistics: II. X-ray Imaging, Spectroscopy and Energy Distribution*, The Astrophysical Journal, 677, 704, 2008
66. Säm Krucker, G.D. Hurford, A.L. MacKinnon, A.Y. Shih, & Robert P. Lin: *Coronal γ -Ray Bremsstrahlung from Solar Flare-accelerated Electrons*, The Astrophysical Journal Letters, 678, L63, 2008
67. G. Trottet, Säm Krucker, T. Lüthi, A. Magun: *Radio submillimeter and γ -ray observations of the 2003 October 28 flare*, The Astrophysical Journal, 678, 509, 2008
68. S. Christe, Säm Krucker, & Robert P. Lin: *Hard X-Rays Associated with Type III Radio Bursts*, The Astrophysical Journal Letters, 680, L149, 2008
69. K.-L. Klein, Säm Krucker, G. Lointier & A. Kerdraon: *Open magnetic flux tubes in the corona and the transport of solar energetic particles*, Astronomy & Astrophysics, 486, 589, 2008
70. P. Saint-Hilaire, Säm Krucker, & Robert P. Lin: *A statistical survey of hard X-ray spectral characteristics of solar flares with two footpoints*, Solar Physics, 250, 53, 2008
71. Säm Krucker, P. Saint-Hilaire, S. Christe, S. M. White, A. D. Chavier, S. D. Bale, & Robert P. Lin: *Coronal Hard X-Ray Emission Associated with Radio Type III Bursts*, The Astrophysical Journal, 681, 644, 2008
72. Säm Krucker and 11 co-authors: *Hard X-ray emission from the solar corona*, Astronomy & Astrophysics Reviews, 16, 155, 2008
73. C. Chifor, H. Isobe, H.E. Mason, I.G. Hannah, P.R. Young, G. Del Zanna, Säm Krucker, K. Ichimoto, Y. Katsukawa, T. Yokoyama: *Magnetic flux cancellation associated with a recurring solar jet observed with Hinode, RHESSI, and STEREO/EUVI*, Astronomy and Astrophysics, 491, 279, 2008
74. Säm Krucker, P.H. Oakley, R.P. Lin: *Spectra of Solar Impulsive Electron Events Observed Near Earth*, Astrophysical Journal, 691, 806, 2009
75. Ya-Hui Yang, C.Z. Cheng, Säm Krucker, R.P. Lin, W.H. Ip: *A Statistical Study of Hard X-Ray Footpoint Motions in Large Solar Flares*, Astrophysical Journal, 693, 132, 2009
76. P. Kaufmann, G. Trottet, C. Giménez de Castro, J.-P. Raulin, Säm Krucker, A.Y. Shih,

- Albert Y., H. Levato: *Sub-terahertz, Microwaves and High Energy Emissions During the 6 December 2006 Flare, at 18:40 UT*, Solar Physics, 255, 131, 2009
77. A. Asai, H. Nakajima, M. Shimojo, T. Yokoyama, S. Masuda, Säm Krucker: *Imaging Spectroscopy on Preflare Coronal Nonthermal Sources Associated with the 2002 July 23 Flare*, Astrophysical Journal, 695, 1623, 2009
78. P. Saint-Hilaire, Säm Krucker, S. Christe, R.P. Lin: *The X-ray Detectability of Electron Beams Escaping from the Sun*, Astrophysical Journal, 696, 941, 2009
79. T. Minoshima, S. Imada, T. Morimoto, T. Kawate, H. Koshiishi, M. Kubo, S. Inoue, H. Isobe, S. Masuda, Säm Krucker, T. Yokoyama: *Multiwavelength Observation of Electron Acceleration in the 2006 December 13 Flare*, Astrophysical Journal, 697, 843, 2009
80. S. Masson, K.-L. Klein, R. Buetikofer, E. Flueckiger, V. Kurt, B. Yushkov, Säm Krucker: *Acceleration of Relativistic Protons during the 20 January 2005 Flare and CME*, Solar Physics, 257, 305, 2009
81. M.D. Fivian, Säm Krucker, R.P. Lin: *Energy Deposition and Hard X-Ray Source Motions in the 2002 July 23 γ -Ray Flare*, Astrophysical Journal, 697, 843, 2009
82. Watanabe, K.; Lin, R. P.; Krucker, S.; Murphy, R. J.; Share, G. H.; Harris, M. J.; Gros, M.; Muraki, Y.; Sako, T.; Matsubara, Y.; and 14 coauthors: *Physics of ion acceleration in the solar flare on 2005 September 7 determines gamma-ray and neutron production*, AdSpR, 44, 789, 2009
83. Giménez de Castro, C. G.; Trottet, G.; Silva-Valio, A.; Krucker, Säm; Costa, J. E. R.; Kaufmann, P.; Correia, E.; Levato, H.: *Submillimeter and X-ray observations of an X class flare*, Astronomy & Astrophysics, 507, 433, 2009
84. Grayson, James A.; Krucker, Säm; Lin, R. P.: *A Statistical Study of Spectral Hardening in Solar Flares and Related Solar Energetic Particle Events*, Astrophysical Journal, 707, 1588, 2009
85. Eastwood, J. P.; Wheatland, M. S.; Hudson, H. S.; Krucker, S.; Bale, S. D.; Maksimovic, M.; Goetz, K.; Bougeret, J.-L.: *On The Brightness and Waiting-Time Distributions of a Type III Radio Storm Observed By Stereo/Waves*, Astrophysical Journal, 708, 95, 2010
86. Feldman, William C.; Lawrence, David J.; Goldsten, John O.; Gold, Robert E.; Baker, Daniel N.; Haggerty, Dennis K.; Ho, George C.; Krucker, Säm; Lin, Robert P.; Mewaldt, Richard A.; and 8 coauthors: *Evidence for extended acceleration of solar flare ions from 1-8 MeV solar neutrons detected with the MESSENGER Neutron Spectrometer*, Journal of Geophysical Research, Volume 115, Issue A1, 2010
87. Temmer, M.; Veronig, A. M.; Kontar, E. P.; Krucker, Säm; Vrsnak, B.: *Combined STEREO and RHESSI Study of Coronal Mass Ejection Acceleration and Particle Acceleration in Solar Flares*, Astrophysical Journal, 712, 1410, 2010
88. Oka, M.; Phan, T.-D.; Krucker, Säm; Fujimoto, M.; Shinohara, I.: *Electron Acceleration by Multi-Island Coalescence*, Astrophysical Journal, 714, 915, 2010
89. Krucker, Säm; Hudson, H. S.; Glesener, L.; White, S. M.; Masuda, S.; Wuelser, J.-P.; Lin, R. P.: *Measurements of the Coronal Acceleration Region of a Solar Flare*, Astrophysical Journal, 714, 1108, 2010
90. Watanabe, Kyoko; Krucker, Säm; Hudson, Hugh; Shimizu, Toshifumi; Masuda, Satoshi; Ichimoto, Kiyoshi: *G-band and Hard X-ray Emissions of the 2006 December 14 Flare Observed by Hinode/SOT and RHESSI*, Astrophysical Journal, 715, 651, 2010
91. Saint-Hilaire, P.; Krucker, Säm; Lin, R. P.: *Statistically Derived Flaring Chromospheric-Coronal Density Structure from Non-thermal X-ray Observations of the Sun*, Astrophysical Journal, 721, 1933, 2010
92. Kahler, S. W.; Krucker, Säm; Szabo, A.: *Solar energetic electron probes of magnetic cloud field line lengths*, Journal of Geophysical Research, Volume 116, Issue A1, CitelID A01104, 2011

93. Martínez Oliveros, J. C.; Couvidat, S.; Schou, J.; Krucker, Säm; Lindsey, C.; Hudson, H. S.; Scherrer, P.: *Imaging Spectroscopy of a White-Light Solar Flare*, Solar Physics, in press, 2011
94. Wang, L.; Lin, R. P.; Krucker, Säm: *Pitch-angle Distributions and Temporal Variations of 0.3-300 keV Solar Impulsive Electron Events*, Astrophysical Journal, 727, 121, 2011
95. Ishikawa, S.; Krucker, Säm; Takahashi, T.; Lin, R. P.: *RHESSI Imaging Survey of gamma-ray Bremsstrahlung Emission in Solar Flares*, Astrophysical Journal, 728, 22, 2011
96. Yang, Ya-Hui; Cheng, C. Z.; Krucker, Säm; Hsieh, Min-Shiu: *Estimation of the Reconnection Electric Field in the 2003 October 29 X10 Flare*, Astrophysical Journal, 732, 15, 2011
97. Krucker, Säm; Raftery, Claire L.; Hudson, Hugh S.: *Temperature and Density Estimates of Extreme-ultraviolet Flare Ribbons Derived from TRACE Diffraction Patterns*, Astrophysical Journal, 734, 34, 2011
98. Christe, S.; Krucker, S.; Saint-Hilaire, P.: *The RHESSI Microflare Height Distribution*, Solar Physics, 270, 493, 2011
99. Baylor, R. N.; Cassak, P. A.; Christe, S.; Hannah, I. G.; Krucker, Säm; Mullan, D. J.; Shay, M. A.; Hudson, H. S.; Lin, R. P.: *Estimates of Densities and Filling Factors from a Cooling Time Analysis of Solar Microflares Observed with RHESSI*, Astrophysical Journal, 736, 75, 2011
100. Agueda, Neus; Krucker, Säm; Lin, Robert P.; Wang, Linghua: *On the Near-Earth Observation of Protons and Electrons from the Decay of Low-energy Solar Flare Neutrons*, Astrophysical Journal, 737, 53, 2011
101. Ishikawa, S.; Krucker, Säm; Takahashi, T.; Lin, R. P.: *On the Relation of Above-the-loop and Footpoint Hard X-Ray Sources in Solar Flares*, Astrophysical Journal, 737, 48, 2011
102. Fletcher, L.; Dennis, B. R.; Hudson, H. S.; Krucker, S.; Phillips, K.; Veronig, A.; Battaglia, M.; Bone, L.; Caspi, A.; Chen, Q.; and 6 coauthors: *An Observational Overview of Solar Flares*, Space Science Reviews, 159, 19, 2011
103. Hannah, I. G.; Hudson, H. S.; Battaglia, M.; Christe, S.; Kašparová, J.; Krucker, S.; Kundu, M. R.; Veronig, A.: *Microflares and the Statistics of X-ray Flares*, Space Science Reviews, 159, 263, 2011
104. Krucker, Säm; Hudson, H. S.; Jeffrey, N. L. S.; Battaglia, M.; Kontar, E. P.; Benz, A. O.; Csillaghy, A.; Lin, R. P.: *High-resolution Imaging of Solar Flare Ribbons and Its Implication on the Thick-target Beam Model*, Astrophysical Journal, 739, 96, 2011
105. Artmann, S.; Schlickeiser, R.; Agueda, N.; Krucker, S.; Lin, R. P.: *A diffusive description of the focused transport of solar energetic particles. Intensity- and anisotropy-time profiles as a powerful diagnostic tool for interplanetary particle transport conditions*, A&A, 535, 92, 2011
106. Raftery, Claire L.; Krucker, Säm; Lin, Robert P.: *Imaging Spectroscopy Using AIA Diffraction Patterns in Conjunction with RHESSI and EVE Observations*, Astrophysical Journal, 743, 27, 2011
107. Krucker, Säm; Kontar, E. P.; Christe, S.; Glesener, L.; Lin, R. P.: *Electron Acceleration Associated with Solar Jets*, Astrophysical Journal, 742, 82, 2011
108. Martínez Oliveros, Juan Carlos; Raftery, Claire L.; Bain, Hazel M.; Liu, Ying; Krupar, Vratislav; Bale, Stuart; Krucker, Säm: *The 2010 August 1 Type II Burst: A CME-CME Interaction and its Radio and White-light Manifestations*, Astrophysical Journal, 748, 66, 2012
109. Matthews, Sarah A.; Williams, David R.; Klein, Karl-Ludwig; Kontar, Eduard P.; Smith, David M.; Lagg, Andreas; Krucker, Sam; Hurford, Gordon J.; Vilmer, Nicole;

- MacKinnon, Alexander L, and 21 co-authors: *Solar Particle Acceleration Radiation and Kinetics (SPARK). A mission to understand the nature of particle acceleration*, *Experimental Astronomy*, 33, 237, 2012
110. Bain, H. M.; Krucker, Säm; Glesener, L.; Lin, R. P., *Radio Imaging of Shock-accelerated Electrons Associated with an Erupting Plasmoid on 2010 November 3*, *Astrophysical Journal*, 750, 44, 2012
111. Raymond, John C.; Krucker, Säm; Lin, Robert P.; Petrosian, Vahé: *Observational Aspects of Particle Acceleration in Large Solar Flares*, *Space Science Reviews*, 47, 2012
112. Martínez Oliveros, Juan-Carlos; Hudson, Hugh S.; Hurford, Gordon J.; Krucker, Säm; Lin, R. P.; Lindsey, Charles; Couvidat, Sebastien; Schou, Jesper; Thompson, W. T.: *The Height of a White-light Flare and Its Hard X-Ray Sources*, *Astrophysical Journal*, 753, 26, 2012
113. Glesener, Lindsay; Krucker, Säm; Lin, R. P.: *Hard X-Ray Observations of a Jet and Accelerated Electrons in the Corona*, *Astrophysical Journal*, 754, 9, 2012
114. Martínez-Oliveros, Juan C.; Lindsey, Charles; Bale, Stuart D.; Krucker, Säm: *Determination of Electromagnetic Source Direction as an Eigenvalue Problem*, *Astrophysical Journal*, 753, 26, 2012
115. Yang, Ya-Hui; Cheng, C. Z.; Krucker, Säm; Hsieh, Min-Shiu; Chen, Nai-Hwa: *Asymmetry of Hard X-Ray Emissions at Conjugate Footpoints in Solar Flares*, *Astrophysical Journal*, 756, 42, 2012
116. Wang, Linghua; Lin, R. P.; Krucker, Säm; Mason, Glenn M.: *A Statistical Study of Solar Electron Events over One Solar Cycle*, *Astrophysical Journal*, 759, 69, 2012