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(831) 254 0800
craigbenko@gmail.com

Links
S2 Corporation
craigbenko.com
linkedin: craigbenko

Personal
Citizenship: US Citizen
Marital Status: Married

Languages
English: native
Spanish: proficient

Programming
Python, Matlab, Mathematica, Igor, LaTeX, Linux, OSX, Windows, Microsoft Office

Hobbies
Skiing, road biking, hiking, camping, climbing, fly fishing, disc golfing, guitar playing, coffee brewing.

Fun facts
Expert taco maker
Knight (w/ sword)
Throws: Right
Bats: Left

Favorite quote
Freedom consists not in doing what we like, but in having the right to do what we ought.

Craig Benko

Physicist

Education

2006-2010 **BS Physics, Santa Clara University** Santa Clara, California
Graduated Cum Laude with minor in mathematics.

2010-2016 **PhD Physics, University of Colorado Boulder** Boulder, Colorado

Experience

2008 **Santa Clara University** Santa Clara, California
Research Assistant
Advisor: Prof. Betty Young and Dr. John R. Jameson
Dielectric relaxation currents. Influence of hydrogen on magnitude of relaxation current for applications in superconducting electronics.

2008-2010 **Santa Clara University** Santa Clara, California
Research Assistant
Advisor: Prof. Chris Weber
Ultrafast laser spectroscopy of semiconductors. Ultrafast electron and spin dynamics in semiconductors.

2010-2016 **JILA, University of Colorado Boulder** Boulder, Colorado
Research Assistant
Advisor: Prof. Jun Ye
Extreme ultraviolet frequency combs. Laser stabilization. Ultrafast laser technology. High-order harmonic generation. Strong-field physics. Atomic clocks. Many-body physics.

2016-Present **S2 Corporation** Bozeman, Montana
Photonics Engineer
Radiofrequency and microwave spectral analysis using spatial-spectral holography. Emphasis on business development.

Professional references

Professor Jun Ye
JILA, NIST and the University of Colorado Boulder
email: ye@jila.colorado.edu

Professor Thomas Allison
Departments of Physics and Chemistry, Stony Brook University
email: thomas.allison@stonybrook.edu

Professor Chris Weber
Department of Physics, Santa Clara University
email: cweber@scu.edu

Academic awards

2006–2010 **Scholarship** Santa Clara University
Santa Clara University Preferred Scholarship.

2008–2010 **Dean's List** Santa Clara University
Reserved for top 10% of class.

2010 **Orella Prize** Santa Clara University
Given at graduation for the highest GPA in upper division sciences.

2010 **David Blockus Award in Physics** Physics Department, Santa Clara University
Given to the most outstanding senior physics major in the graduating class.

2010 **John R. Drahmann Award in Physics** Physics Department, Santa Clara University
Given to the senior physics major for exemplifying the hard work an honest values of John Drahmann.

2011 **Best Poster** SUSSP67, Glasgow, Scotland
Given for the best poster at the Scottish University Summer School in Physics 67 (SUSSP67).

2014 **Outstanding Presentation** Boulder National Labs, Boulder, Colorado
Given for the best poster and presentation at the Boulder National Labs Postdoc Poster Symposium.

Publications

articles in peer-reviewed journals

Dielectric relaxation study of hydrogen exposure as a source of two-level systems in Al_2O_3

J R Jameson, D Ngo, **C Benko**, J P McVittie, Y Nishi, B A Young
Journal of Non-Crystalline Solids. *357, 2148–2151 (2011).*
URL: `http://dx.doi.org/10.1016/j.jnoncrysol.2011.02.054`

Measurement of spin diffusion in semi-insulating GaAs

C P Weber, **C Benko** A, S C Hiew
Journal of Applied Physics. *109, 106101 (2011).*
URL: `http://dx.doi.org/10.1063/1.3592272`

Ultrabroadband coherent supercontinuum frequency comb

A Ruehl, M J Martin, K C Cossel, L Chen, H McKay, B Thomas, **C Benko**, L Dong, J M Dudley, M E Fermann, I Hartl, J Ye
Physical Review A. *84, 011806 (2011).*
URL: `http://dx.doi.org/10.1103/PhysRevA.84.011806`

Inelastic collisions and density-dependent excitation suppression in a ^{87}Sr optical lattice clock

M Bishof, M J Martin, M D Swallows, **C Benko**, Y Lin, G Quéméner, A M Rey, J Ye
Physical Review A. *84, 052716 (2011).*
URL: `http://dx.doi.org/10.1103/PhysRevA.84.052716`

Full phase stabilization of a Yb: fiber femtosecond frequency comb via high-bandwidth transducers

C Benko, A Ruehl, M J Martin, K S E Eikema, M E Fermann, I Hartl, J Ye
Optics Letters. *37, 2196–2198 (2012).*
URL: `http://dx.doi.org/10.1364/OL.37.002196`

Operating a ^{87}Sr optical lattice clock with high precision and at high density

M D Swallows, M J Martin, M Bishof, **C Benko**, Y Lin, S Blatt, A M Rey, J Ye

Ultrasonics, Ferroelectrics and Frequency Control, IEEE Transactions on. *59, 416–425 (2012).*

URL: `http://dx.doi.org/10.1109/TUFFC.2012.2210`

A quantum many-body spin system in an optical lattice clock
M J Martin, M Bishof, M D Swallows, X Zhang, **C Benko**, J von Stretcher, A M Rey, J Ye
Science. *341, 632–636 (2013).*

URL: `http://dx.doi.org/10.1126/science.1236929`

Extreme ultraviolet radiation with coherence time greater than 1 s
C Benko, T K Allison, A Cingöz, L Hua, F Labaye, D C Yost, J Ye
Nature Photonics. *8, 530–536 (2014).*

URL: `http://dx.doi.org/10.1038/nphoton.2014.132`

Reduction of residual amplitude modulation to 1×10^{-6} for frequency modulation and laser stabilization
W Zhang, M J Martin, **C Benko**, J L Hall, J Ye, C Hagemann, T Legero, U Sterr, F Riehle, G D Cole, M Aspelmeyer
Optics Letters. *39, 1980–1983 (2014).*

URL: `http://dx.doi.org/10.1364/OL.39.001980`

Probing many-body interactions in an optical lattice clock
A M Rey, A V Gorshkov, C V Kraus, M J Martin, M Bishof, M D Swallows, X Zhang, **C Benko**, J Ye, N D Lemke, A Ludlow
Annals of Physics. *340, 311–351 (2014).*

URL: `http://dx.doi.org/10.1016/j.aop.2013.11.002`

Cavity-enhanced field-free molecular alignment at a high repetition rate
C Benko, L Hua, T K Allison, F Labaye, J Ye
Physical Review Letters. *114, 153001 (2015).*

URL: `http://dx.doi.org/10.1103/PhysRevLett.114.153001`

An XUV frequency comb with mW average power
C Benko, N Doerre, J Ye
In preparation.

peer-reviewed conferences/proceedings

Coherent transfer over 1.1 spectral octave with a fiber frequency comb
A Ruehl, M J Martin, K C Kossel, L Chen, **C Benko**, H McKay, B Thomas, L Dong, M E Fermann, J M Dudley, I Hartl, J Ye
European Quantum Electronics Conference (2011).

Towards the next decades of precision and accuracy in a ^{87}Sr optical lattice clock M Martin, Y Lin, M D Swallows, M Bishof, S Blatt, **C Benko**, L Chen, T Hirokawa, A M Rey, J Ye
APS Division of Atomic, Molecular and Optical Physics Meeting Abstracts (2011).

Probing many-body physics with an optical lattice clock
M Bishof, M J Martin, M D Swallows, **C Benko**, J von Stecher, A V Gorshkov, A M Rey, J Ye
APS Division of Atomic, Molecular and Optical Physics Meeting Abstracts (2012).

Phase stabilization of a Yb:fiber frequency comb via high-bandwidth transducers
A Ruehl, **C Benko**, M J Martin, K S E Eikema, M E Fermann, I Hartl, J Ye
CLEO: Science and Innovations (2012).

Probing many-body spin interactions with an optical lattice clock
A M Rey, M J Martin, M D Swallows, M Bishof, **C Benko**, S Blatt, J von Stecher, A Gorshkov, J Ye
Frequency Control Symposium (FCS), 2012 IEEE International (2012).

Direct measurement of the XUV frequency comb coherence
C Benko, T K Allison, A Cingöz, D C Yost, J Ye
APS Division of Atomic, Molecular and Optical Physics Meeting Abstracts (2013).

High brightness XUV frequency combs via intracavity high harmonic generation
T K Allison, A Cingöz, **C Benko**, D C Yost, A Ruehl, M Fermann, I Hartl, J Ye
EPJ Web of Conferences (2013).

Phase coherent extreme ultraviolet radiation
C Benko, T K Allison, A Cingöz, D C Yost, J Ye
Advanced Solid State Lasers (2013).

Extreme ultraviolet radiation with coherence time beyond 1 second T K Allison, **C Benko**, L Hua, F Labaye, D C Yost, J Ye
APS Division of Atomic, Molecular and Optical Physics Meeting Abstracts (2014).

XUV frequency comb
J Ye, **C Benko**
Latin America Optics and Photonics Conference (2014).

scientific press

The day the lab stood still
J Phillips
JILA: Light and Matter (2011).

Lasers & Sources: Frequency comb metrology goes extreme UV
A Cingöz, T K Allison, D C Yost, **C Benko**, J Ye, A Ruehl, M E Fermann, I Hartl, J. Ye
SPIE Newsroom (2012).

Super-accurate atomic clock doubles up as quantum sim
L Grossman
New Scientist (2013).

Scaling combs into the XUV
D Pile
Nature Photonics (2014).

Rapid Alignment
K Wright
Physics Synopsis, APS (2015).

A Bug's Life
J Phillips
JILA: Light and Matter (2015).

Combing Frequencies
Ivy F. Kupec
National Science Foundation Discovery (2015).

Talks

2009 **Using lasers to understand magnetic semiconductors** Santa Clara, California
Undergraduate Science and Engineering Symposium
at Santa Clara University.

2009 **Optical transient-grating detection of ferromagnetic diffusion in GaMnAs.** Santa Clara, California
Physics Colloquium at Santa Clara University.

2011 **A ^{87}Sr optical lattice clock: towards the next decade of accuracy and stability** Glasgow, Scotland
Scottish University Summer School in Physics 67 (SUSSP:67).

2012 **Frequency combs in the extreme ultraviolet** Thun, Switzerland
Invited. Advances in Laser Technology (ALT) Conference.

2013 **Direct measurement of the phase coherence**

	of XUV frequency combs *Invited.* Ultrafast Optics IX.	Davos, Switzerland
2013	**Direct measurement of the XUV comb coherence** APS Division of Atomic, Molecular, and Optical Physics (DAMOP) Conference.	Quebec, Canada
2013	**Phase coherent extreme ultraviolet radiation** *Invited.* Advanced Solid State Lasers (ASSL) Conference.	Paris, France
2014	**Phase coherent extreme ultraviolet radiation** *Invited.* High Intensity Lasers and Strong-field Phenomena (HILAS) Conference.	Berlin, Germany
2014	**Phase coherent extreme ultraviolet radiation: frequency metrology to attosecond physics.** Deutsches Elektronen-Synchrotron (DESY).	Hamburg, Germany
2014	**Phase coherent extreme ultraviolet radiation: frequency metrology to attosecond physics.** Max-Planck-Institut für Quantenoptik.	Garching, Germany
2014	**XUV frequency combs** Schafer-Gaarde Group, Lousiana State University.	Baton Rouge, Louisiana
2014	**XUV frequency combs** *Invited.* Latin America Optics and Photonics Conference.	Cancun, Mexico
2015	**XUV frequency combs** *Invited.* 5^{t} International Conference on Attosecond Physics.	Quebec, Canada
2015	**XUV frequency combs** *Invited.* Ultrafast Optics X.	Beijing, China
2015	**XUV frequency combs: physics from seconds to attoseconds** Reis Group, PULSE Institute and Stanford University.	Palo Alto, CA
2015	**XUV frequency combs: interferometry in the XUV** Müller Group, University of California Berkeley.	Berkeley, CA
2016	**XUV frequency combs: coherent light below 100 nm** S2 Corporation	Bozeman, MT
2016	**XUV frequency combs: coherent light below 100 nm** Hommelhoff Group, Friedrich-Alexander-Universität	Erlangen, Germany

Non-scientific employment

2002–2004	**Longs Drugstore** Register clerk. Shelf stocker.	Watsonville, California
2004–2006	**Seascape Golf Club** Cart attendant. Driving range maintenance.	Aptos, California
2007	**Santa Clara University** Archival assistant.	Santa Clara, California
2007	**Sprig Electric** Summer internship for researching alternative energy viability for an electrical contractor in the Silicon Valley.	San Jose, California
2007–2010	**Private Tutor** Private tutor for mathematics, physics, and SAT preparation. Operated independently and through the Drahmann Center at Santa Clara University.	Santa Clara, California