

JOSEPH HARRY SILBER

a.k.a. Joe Silber

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EDUCATION

University of California, Berkeley

M.S. in Mechanical Engineering

2009

Major Area: Composite materials

Report: "Several experiments in melt infiltration of glass fiber by a polypropylene matrix"

University of California, Berkeley

B.S. in Mechanical Engineering

2008

Honors in Mechanical Engineering

Stanford University

B.A. in Studio Art

2005

Sculpture and Photography

EMPLOYMENT

Lawrence Berkeley National Lab, Berkeley CA

Mechanical Engineer IV

2020 - present

Senior level engineer, in addition to duties described below.

Lawrence Berkeley National Lab, Berkeley CA

Mechanical Engineer III

2015 - 2019

Subsystem project manager, in addition to engineering duties described below.

Lawrence Berkeley National Lab, Berkeley CA

Mechanical Engineer II

2010 - 2014

Mechanical design, structural analysis, construction, test, and verification oversight for high energy physics and cosmology instrumentation.

San Francisco Children's Art Center, San Francisco CA

Art Teacher

2005-2006

Steven Grover & Associates, Berkeley CA

Junior Designer

2003-2004

Structural engineering for bicycle/pedestrian bridges, tunnels, and overpasses.

eLock Technologies, LLC, Berkeley CA

Junior Designer

2003-2004

Interface and mechanical design of electronically-controlled public transit bike locker system.

PAPERS

"The Early Data Release of the Dark Energy Spectroscopic Instrument"

arXiv preprint

2023

<https://doi.org/10.48550/arXiv.2306.06308>*"The Optical Corrector for the Dark Energy Spectroscopic Instrument"*

arXiv preprint

2023

<https://doi.org/10.48550/arXiv.2306.06310>*"Validation of the Scientific Program for the Dark Energy Spectroscopic Instrument"*

arXiv preprint

2023

<https://doi.org/10.48550/arXiv.2306.06307>*"The Robotic Multi-Object Focal Plane System of the Dark Energy Spectroscopic Instrument (DESI)"*

The Astronomical Journal, Volume 165, Issue 1, id.9, 40 pp.

2023

<https://doi.org/10.3847/1538-3881/ac9ab1>*"Overview of the Instrumentation for the Dark Energy Spectroscopic Instrument"*

The Astronomical Journal, 164:207 (62pp), 2022 November

2022

<https://doi.org/10.3847/1538-3881/ac882b>

- "25,000 optical fiber positioning robots for next-generation cosmology"*
Conference paper. 37th Annual Meeting of The American Society for Precision Engineering **2022**
<https://arxiv.org/abs/2212.07908>
- "The MegaMapper: A Stage-5 Spectroscopic Instrument Concept for the Study of Inflation and Dark Energy"*
Contributed White Paper to Snowmass 2021 **2022**
<https://arxiv.org/abs/2209.04322>
- "MegaMapper: concept and optical design for a 6.5m aperture massively multiplexed spectroscopic facility"*
Proc. SPIE 12182, Ground-based and Airborne Telescopes IX; 1218230 **2022**
<https://doi.org/10.1117/12.2625992>
- "Installation of the Dark Energy Spectroscopic Instrument at the Mayall 4-meter telescope"*
Proc. SPIE 11447, Ground-based and Airborne Instrumentation for Astronomy VIII; 1144710 **2020**
<https://doi.org/10.1117/12.2561507>
- "Performance of the Dark Energy Spectroscopic Instrument (DESI) focal plane"*
Proc. SPIE 11447, Ground-based and Airborne Instrumentation for Astronomy VIII; 114478K **2020**
<https://doi.org/10.1117/12.2561631>
- "Precision alignment and integration of DESI's focal plane using a laser tracker"*
Proc. SPIE 11445, Ground-based and Airborne Telescopes VIII; 114456J **2020**
<https://doi.org/10.1117/12.2562687>
- "The DESI Fiber View Camera System"*
Publications of the Astronomical Society of the Pacific, Volume 131, Number 1000 **2019**
<https://www.doi.org/10.1088/1538-3873/ab15c2>
- "Astro2020 APC White Paper: The MegaMapper: a $z > 2$ spectroscopic instrument for the study of Inflation and Dark Energy"*
arXiv:1907.11171, Jul 2019 **2019**
<https://arxiv.org/abs/1907.11171>
- "Focal plate structure alignment of the Dark Energy Spectroscopic Instrument"*
J. of Astronomical Telescopes, Instruments, and Systems, 5(1), 014003 (2019) **2019**
<https://doi.org/10.1117/1.JATIS.5.1.014003>
- "Overview of the Dark Energy Spectroscopic Instrument"*
Proc. SPIE 10702, Ground-based and Airborne Instrumentation for Astronomy VII, 107021F **2018**
<https://doi.org/10.1117/12.2313063>
- "Dark Energy Spectroscopic Instrument (DESI) Fiber Positioner Production"*
Proc. SPIE 10706, Adv. in Optical and Mech. Technol. for Telescopes and Inst. III; 1070669 **2018**
<https://doi.org/10.1117/12.2312228>
- "Dark Energy Spectroscopic Instrument (DESI) fiber positioner thermal and wind disturbance test"*
Proc. SPIE 10706, Adv. in Optical and Mech. Technol. for Telescopes and Inst. III; 107064R **2018**
<https://doi.org/10.1117/12.2314666>
- "ProtoDESI: First On-Sky Technology Demonstration for the Dark Energy Spectroscopic Instrument"*
Publications of the Astronomical Society of the Pacific, Volume: 130; Issue: 984 **2018**
<https://doi.org/10.1088/1538-3873/aaa225>
- "The STAR MAPS-based PiXeL detector"*
Nuclear Inst. and Methods in Physics Research, A, Volume 907, p. 60-80. **2018**
<https://doi.org/10.1016/j.nima.2018.03.003>
- "Geometric analysis of enhanced thermal conductivity in epoxy composites: A comparison of graphite and carbon nanofiber fillers"*
Phys. Status Solidi A214, No. 1, 1600368 (2017) **2017**
<https://doi.org/10.1002/pssa.201600368>
- "Using short helically wrapped single-mode fibers as illuminated fiducials"*
Proceedings Volume 9951, Optical System Alignment, Tolerancing, and Verification X; 99510Q **2016**
<https://doi.org/10.1117/12.2236690>
- "DESI focal plate mechanical integration and cooling"*
Proceedings of the SPIE, Volume 9908, id. 99088Q 12 pp. (2016) **2016**
<https://doi.org/10.1117/12.2232978>

- "ProtoDESI: risk reduction experiment for the Dark Energy Spectroscopic Instrument"*
 Proceedings of the SPIE, Volume 9908, id. 99087X 9 pp. (2016) **2016**
<https://doi.org/10.1117/12.2231760>
- "The DESI fiber positioner system"*
 Proceedings of the SPIE, Volume 9908, id. 990892 6 pp. (2016) **2016**
<https://doi.org/10.1117/12.2233370>
- "The STAR Heavy Flavor Tracker (HFT): focus on the MAPS based PXL detector"*
 Nuclear and Particle Physics Proceedings 273-275 (2016) 1155-1159 **2016**
<https://doi.org/10.1016/j.nuclphysbps.2015.09.181>
- "Impact of optical distortions on fiber positioning in the dark energy spectroscopic instrument"*
 Proc. SPIE, Volume 9908, id. 99088F **2016**
<https://doi.org/10.1117/12.2232689>
- "The DESI Experiment Part I: Science, Targeting, and Survey Design"*
 arXiv:1611.00036, Oct 2016 **2016**
<https://arxiv.org/abs/1611.00036>
- "The DESI Experiment Part II: Instrument Design"*
 arXiv:1611.00037, Oct 2016 **2016**
<https://arxiv.org/abs/1611.00037>
- "Experience from the construction and operation of the STAR PXL detector"*
 Journal of Instrumentation, April 2015 **2015**
<http://dx.doi.org/10.1088/1748-0221/10/04/C04014>
- "A MAPS Based Micro-Vertex Detector for the STAR Experiment"*
 Physics Procedia 66 (2015) 514 – 519 **2015**
<http://dx.doi.org/10.1016/j.phpro.2015.05.067>
- "Planning the installation of the dark energy spectroscopic instrument on the Mayall Telescope"*
 Proc. SPIE 9145, Ground-based and Airborne Telescopes V, 91453Y **2014**
<http://dx.doi.org/10.1117/12.2055625>
- "Focal ratio degradation performance of fiber positioning technology used in the Dark Energy Spectroscopic Instrument (DESI)"*
 Proc. SPIE 9147, Ground-based and Airborne Instrumentation for Astronomy V, 914763 **2014**
<http://dx.doi.org/10.1117/12.2054454>
- "Novel fabrication techniques for low-mass composite structures in silicon particle detectors"*
 NUCLEAR INSTRUMENTS AND METHODS IN PHYSICS RESEARCH SECTION A; 732; 103-108 **2013**
<http://dx.doi.org/10.1016/j.nima.2013.07.005>
- "The measuring apparatus research for BigBOSS fiber-positioner"*
 Proc. SPIE 8446, Ground-based and Airborne Instrumentation for Astronomy IV, 84465Q **2012**
<http://dx.doi.org/10.1117/12.925103>
- "Design and performance of an R-θ fiber positioner for the BigBOSS instrument"*
 Proc. SPIE 8450, Modern Technologies in Space- and Ground-based Telescopes and Instrumentation II, 845038 **2012**
<http://dx.doi.org/10.1117/12.926457>
- "BigBOSS: a stage IV dark energy redshift survey"*
 Proc. SPIE 8446, Ground-based and Airborne Instrumentation for Astronomy IV, 844667 **2012**
<http://dx.doi.org/10.1117/12.926179>
- "A MAPS based vertex detector for the STAR experiment at RHIC"*
 Nuclear Instruments and Methods in Physics Research A 650 (2011) 68–72 **2011**
<http://dx.doi.org/10.1016/j.nima.2010.12.006>

CONFERENCE TALKS

- "Want to map the cosmos? Build yourself a tiny robot army!"*
<https://sites.google.com/lbl.gov/quarknet-workshop/home>
QuarkNet Workshop 2023: Physics in and Through Cosmology **2023**
 Berkeley, CA

"DESI fiber positioner testing and performance"

<https://doi.org/10.1117/12.2311573>

SPIE Astronomical Telescopes + Instrumentation
Austin, TX

2018

"Elements of Fabrication II - Material Properties Developed and Testing"

"Composite Joining Techniques: Bolted Joints"

"Thermal modeling, interfaces, test results"

Composites Workshop for Silicon Particle Detectors
Lawrence Berkeley National Lab, Berkeley, CA

2016

"Composites Structures for Detectors in Colliding Beam Experiments"

SAMPE Emerging Materials Technology Symposium
Mountain View, CA

2015

"An Explicit Approach to the Problem of Personal Identity"

Spring Undergrad Philosophy Conference
Stanford University, Stanford, CA

2000

COMMITTEES

Physical Sciences Workplace Life Committee
Lawrence Berkeley National Lab, Berkeley, CA

2016 - 2021

Net-Zero Lab Visioning Team
Lawrence Berkeley National Lab, Berkeley, CA

2022 - present

AWARDS

SPOT Award

"In recognition of your contributions in the preparation and submission of the DARPA MuS2 proposal."
Lawrence Berkeley National Lab, Berkeley, CA

2022

Department of Energy Project Management Excellence Award

"Presented to The Office of Science's Dark Energy Spectroscopic Instrument Project. In recognition of the successful delivery of the Dark Energy Spectroscopic Instrument (DESI) project at Lawrence Berkeley National Laboratory. This \$56 million project delivered a state-of-the-art instrument to the Mayall Telescope at Kitt Peak, Arizona, transforming it into the most powerful multi-object spectrographs in existence."
Lawrence Berkeley National Lab, Berkeley, CA

2021

SPOT Award

For successful delivery of DESI Focal Plane and completion of CD-4 project milestone.
Lawrence Berkeley National Lab, Berkeley, CA

2020

SPOT Award

For successful completion of DESI Fiber Positioner system.
Lawrence Berkeley National Lab, Berkeley, CA

2019

SPOT Award

"The team has demonstrated extraordinary dedication and developed creative engineering solutions to design, fabricate, integrate, and test the focal plane system components."
Lawrence Berkeley National Lab, Berkeley, CA

2018

SPOT Award

"For your outstanding contributions and expense-saving efforts on the DESI project."
Lawrence Berkeley National Lab, Berkeley, CA

2015

LANGUAGES

English – native

Italian – formerly conversational, out of practice

Matlab, C, Python – native