

In 2019, the National Academy of Sciences received 572 white papers concerning the sciences as part of the Astro2020 Decadal Survey on Astronomy and Astrophysics. Below you may find a table of all of the science white papers in alphabetical order by lead author. Click on the link to download the full PDF of the white paper.

Principal Author	Institution of Principal Author	Title	File
Aalto, Susanne	Chalmers University of Technology, Sweden	Extremely obscured galaxy nuclei — hidden AGNs and extreme starbursts	astro2020_swp_Aalto_S
Airapetian, Vladimir	NASA GSFC and American University, DC	Reconstructing Extreme Space Weather From Planet Hosting Stars	astro2020_swp_Airapetian_p
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Anderson, Loren	West Virginia University	HII Regions and the Warm Ionized Medium	astro2020_swp_Anderson_L
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Apai, Daniel	University of Arizona	Planetary Habitability Informed by Planet Formation and Exoplanet Demographics	astro2020_swp_Apai_D2
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Baker, John	NASA Goddard Space Flight Center	Multimessenger science opportunities with mHz gravitational waves	astro2020_swp_Baker_J
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Barnes, Rory	University of Washington	Geoscience and the Search for Life Beyond the Solar System	astro2020_swp_Barnes_R
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Basu, Kaustuv	University of Bonn	"SZ spectroscopy" in the coming decade: Galaxy cluster cosmology and astrophysics in the submillimeter	astro2020_swp_Basu_K
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Gallo, Elena	University of Michigan	Towards a high accuracy measurement of the local black hole occupation fraction in low mass galaxies	astro2020_swp_Gallo_E
Garcia, Javier	California Institute of Technology	Probing the Black Hole Engine with Measurements of the Relativistic X-ray Reflection Component	astro2020_swp_Garcia_J
Garcia, Miriam	Centro de Astrobiología, CSIC-INTA	Walking along Cosmic History: Metal-poor Massive Stars	astro2020_swp_Garcia_M
Gary, Dale	New Jersey Institute of Technology	Particle Acceleration and Transport, New Perspectives from Radio, X-ray, and Gamma-Ray Observations	astro2020_swp_Gary_D
Gaspar, Andras	Steward Observatory, The University of Arizona	Modeling Debris Disk Evolution	astro2020_swp_Gaspar_A
Gaudi, B. Scott	The Ohio State University	‘Auxiliary’ Science with the WFIRST Microlensing Survey	astro2020_swp_Gaudi_B
Geach, James	University of Hertfordshire	The case for a 'sub-millimeter SDSS': a 3D map of galaxy evolution to $z \sim 10$	astro2020_swp_Geach_J
Gelfand, Joseph	NYU Abu Dhabi	MeV Emission from Pulsar Wind Nebulae: Understanding Extreme Particle Acceleration in Highly Relativistic Outflows	astro2020_swp_Gelfand_J
Ghosh, Tapasi	Green Bank Observatory, WV	Radio Spectral Line Probe of Evolution of Fundamental Constants	astro2020_swp_Ghosh_T

Gies, Douglas	Georgia State University	High Angular Resolution Astrophysics: Evolutionary Impact of Stellar Mass Loss	astro2020_swp_Gies_D
Gilbert, Karoline	Space Telescope Science Institute	Construction of an L [^] — Galaxy: the Transformative Power of Wide Fields for Revealing the Past, Present and Future of the Great Andromeda System	astro2020_swp_Gilbert_K
Ginsburg, Adam	National Radio Astronomy Observatory	Galactic center star formation & feedback: key questions	astro2020_swp_Ginsburg_A
Gluscevic, Vera	University of Florida	Cosmological Probes of Dark Matter Interactions: The Next Decade	astro2020_swp_Gluscevic_V
Goicoechea, Javier R.	CSIC, Madrid, Spain	Stellar Feedback in the ISM Revealed by Wide-Field Far-Infrared Spectral-Imaging	astro2020_swp_Goicoechea_J
Gordon, Karl	Space Telescope Science Institute	Interstellar Dust Grains: Ultraviolet and Mid-IR Extinction Curves	astro2020_swp_Gordon_K
Graham, Melissa	University of Washington	Discovery Frontiers of Explosive Transients: An ELT and LSST Perspective	astro2020_swp_Graham_M
Green, Daniel	University of California San Diego	Messengers from the Early Universe: Cosmic Neutrinos and Other Light Relics	astro2020_swp_Green_D
Green, Joel	Space Telescope Science Institute	Variability in the Assembly of Protostellar Systems	astro2020_swp_Green_J
Greene, Jenny	Princeton University	The Local Relics of of Supermassive Black Hole Seeds	astro2020_swp_Greene_J
Greene, Thomas	NASA Ames Research Center	Characterizing Transiting Exo&SS with JWST Guaranteed Time and ERS Observations	astro2020_swp_Greene_T
Grin, Daniel	Haverford College	Gravitational probes of ultra-light axions	astro2020_swp_Grin_D
Grindlay, Jonathan	Harvard University	Big Science with a nUV-MidIR Rapid-Response 1.3m Telescope at L2	astro2020_swp_Grindlay_J
Grohs, Evan	University of California, Berkeley	Big Bang Nucleosynthesis and Neutrino Cosmology	astro2020_swp_Grohs_E
Grossan, Bruce	UC Berkeley Space Sciences Laboratory	Measurement of the Optical-IR Spectral Shape of Prompt Gamma-Ray Burst Emission: A Timely Call to Action for Gamma-Ray Burst Science	astro2020_swp_Grossan_B
Gry, Cecile	Laboratoire d'Astrophysique de Marseille, Aix Marseille Univ.	Far- to near-UV spectroscopy of the interstellar medium at very high resolution and very high signal-to-noise ratio	astro2020_swp_Gry_C
Gudipati, Murthy	Jet Propulsion Laboratory, California Institute of Technology	From Interstellar Ice Grains to Evolved Planetary Systems: The Role of Laboratory Studies	astro2020_swp_Gudipati_M
Guiriec, Sylvain	George Washington University / NASA Goddard Space Flight Center	Gamma-Ray Science in the 2020s	astro2020_swp_Guiriec_S

Gultekin, Kayhan	University of Michigan	Black Holes Across Cosmic Time	astro2020_swp_Gultekin_K
Gutermuth, Robert	University of Massachusetts Amherst	Dense Cores, Stellar Feedback and the Origins of Clustered Star Formation	astro2020_swp_Gutermuth_R
Hagen, Lea	STScI	Spatially Resolved Observations of the Ultraviolet Attenuation Curve	astro2020_swp_Hagen_L
Haiman, Zoltan	Columbia University	Electromagnetic Window into the Dawn of Black Holes	astro2020_swp_Haiman_Z
Hammel, Heidi	AURA	Solar System Science with the James Webb Space Telescope	astro2020_swp_Hammel_H
Haqq-Misra, Jacob	Blue Marble Space Institute of Science	Searching for Technosignatures: Implications of Detection and Non-Detection	astro2020_swp_Haqq-Misra_J
Harding, Alice	NASA Goddard Space Flight Center	Prospects for Pulsar Studies at MeV Energies	astro2020_swp_HARDING_A
Harding, J. Patrick	Los Alamos National Laboratory	Exploring Beyond-the-Standard-Model Physics with TeV Gamma-rays	astro2020_swp_Harding_J
Harman, Chester	Columbia University	A Balancing Act: Biosignature and Anti-Biosignature Studies in the Next Decade and Beyond	astro2020_swp_Harman_C
Harrington, Kevin	Argelander Institute for Astronomy, Bonn, Germany	The Extended Cool Gas Reservoirs Within $z > 1$ (Proto-)Cluster Environments	astro2020_swp_Harrington_K
Heap, Sara	Emerita scientist, Goddard Space Flight Center	Understanding Cosmic Evolution: The Role of UV Spectroscopic and Imaging Surveys	astro2020_swp_Heap_S
Heiles, Carl	University of California at Berkeley	Galactic and Extragalactic Astrochemisry: Heavy-Molecule Precursors to Life?	astro2020_swp_heiles_c
Hensley, Brandon	Princeton University	Determining the Composition of Interstellar Dust with Far-Infrared Polarimetry	astro2020_swp_Hensley_B
Heyer, Mark	University of Massachusetts, Amherst	Far Infrared Spectroscopic Imaging of the Neutral Interstellar Medium in Galaxies	astro2020_swp_Heyer_M
Heyl, Jeremy	University of British Columbia	Exploring the physics of neutron stars with high-resolution, high-throughput X-ray spectroscopy	astro2020_swp_Heyl_J
Hickox, Ryan	Dartmouth College	Resolving the cosmic X-ray background with a next-generation high-energy X-ray observatory	astro2020_swp_Hickox_R
Hillenbrand, Lynne	California Institute of Technology	Young Pre-Main Sequence Stars: Accretion/Outflow, Planet Formation, and Contraction/Spin-Up on the Active Journey to a Main Sequence Life of Boredom	astro2020_swp_hillenbrand_l
Hinkel, Natalie	Southwest Research Institute	Stellar Characterization Necessary to Define Holistic Planetary Habitability	astro2020_swp_Hinkel_N1
Hinkel, Natalie	Southwest Research Institute	An Interdisciplinary Perspective on Elements in Astrobiology: From Stars to Planets to Life	astro2020_swp_Hinkel_N2
Hlořek, Renée	Department of Astronomy and Astrophysics &	Single-object Imaging and Spectroscopy to Enhance Dark Energy Science from LSST	astro2020_swp_Hlořek_R

	Dunlap Institute for Astronomy and Astrophysics, University of Toronto		
Hodges-Kluck, Edmund	University of Maryland/NASA GSFC	How does dust escape from galaxies?	astro2020_swp_Hodges-Kluck_E1
Hodges-Kluck, Edmund	University of Maryland/NASA GSFC	Hot Drivers of Stellar Feedback from 10 to 10,000 pc	astro2020_swp_Hodges-Kluck_E2
Hogan, Jason	Stanford University	Gravitational Waves in the Mid-band with Atom Interferometry	astro2020_swp_Hogan_J
Holder, Gilbert	University of Illinois at Urbana- Champaign	Tracking the time-variable Millimeter-wavesky with CMB experiments	astro2020_swp_Holder_G
Holder, Jamie	University of Delaware	Understanding the Origin and Impact of Relativistic Cosmic Particles with Very-High-Energy Gamma-rays	astro2020_swp_Holder_J
Holland, Wayne	UK Astronomy Technology Centre, Royal Observatory, Edinburgh, UK	Debris disks: Exploring the environment and evolution of planetary systems	astro2020_swp_Holland_W
Holler, Bryan	STScI	"It's full of asteroids!": Solar system science with a large field of view	astro2020_swp_Holler_B
Horzempa, Philip	LeMoyne College	High Definition Astrometry	astro2020_swp_Horzempa_P
Hosek, Matthew	UCLA	Star Formation in Different Environments: The Initial Mass Function	astro2020_swp_Hosek_M
Hu, Renyu	Jet Propulsion Laboratory	The Super-Earth Opportunity — Search for Habitable Exoplanets in the 2020s	astro2020_swp_Hu_R
Huber, Daniel	Institute for Astronomy, University of Hawaii	Stellar Physics and Galactic Archeology using Asteroseismology in the 2020's	astro2020_swp_Huber_D
Huff, Eric	Jet Propulsion Laboratory	Galaxy Kinematics and the Future of Dark Energy	astro2020_swp_Huff_E
Hunter, Todd	National Radio Astronomy Observatory	Understanding Accretion Outbursts in Massive Protostars through Maser Imaging	astro2020_swp_Hunter_T
Hutter, Anne	Kapteyn Astronomical Institute, University of Groningen	A proposal to exploit galaxy-21cm synergies to shed light on the Epoch of Reionization	astro2020_swp_Hutter_A
Isella, Andrea	Rice University	Observing Planetary Systems in the Making	astro2020_swp_Isella_A
Jackson, James	USRA	Far-Infrared studies of Star and Planet Formation	astro2020_swp_Jackson_J
James, Bethan	Space Telescope Science Institute	Spatially Resolved UV Nebular Diagnostics in Star- Forming Galaxies	astro2020_swp_James_B
Jang-Condell, Hannah	University of Wyoming	Protoplanetary Disk Science Enabled by Extremely Large Telescopes	astro2020_swp_Jang-Condell_H

Ji, Alexander	Carnegie Observatories	Local Dwarf Galaxy Archaeology	astro2020_swp_Ji_A
Ji, Hantao	Princeton University	Major Scientific Challenges and Opportunities in Understanding Magnetic Reconnection and Related Explosive Phenomena throughout the Universe	astro2020_swp_Ji_H
Johnson, Jennifer	Ohio State University	The Origin of the Elements Across Cosmic Time	astro2020_swp_Johnson_J
Johnson, Megan	United States Naval Observatory	The Next Generation Celestial Reference Frame	astro2020_swp_Johnson_M1
Johnson, Marshall	The Ohio State University	Tracing the Origins and Evolution of Small Planets using Their Orbital Obliquities	astro2020_swp_Johnson_M2
Juanola-Parramon, Roser	NASA GSFC/UMBC	Solar System Science with Space Telescopes	astro2020_swp_Juanola-Parramon
Kalogera, Vassiliki	Northwestern U.	The Yet-unobserved Multi-Messenger Gravitational-Wave Universe	astro2020_swp_Kalogera_V1
Kalogera, Vicky	Northwestern U.	Deeper, Wider, Sharper: Next-Generation Ground-based Gravitational-Wave Observations of Binary Black Holes	astro2020_swp_Kalogera_V2
Kamraj, Nikita	California Institute of Technology	Probing the Physical Properties of the Corona in Accreting Black Holes	astro2020_swp_Kamraj_N
Kane, Stephen	University of California, Riverside	Venus as a Nearby Exoplanetary Laboratory	astro2020_swp_Kane_S
Kao, Der-You	NASA Goddard Space Flight Center/ Universities Space Research Association	Impacts of Quantum Chemistry Calculations on Exoplanetary Science, Planetary Astronomy, and Astrophysics	astro2020_swp_Kao_D
Kao, Melodie	Arizona State University	Magnetism in the Brown Dwarf Regime	astro2020_swp_Kao_M
Kara, Erin	University of Maryland, NASA GSFC, MIT	X-ray follow-up of extragalactic transients	astro2020_swp_Kara_E
Kartaltepe, Jeyhan	Rochester Institute of Technology	Assembly of the Most Massive Clusters at Cosmic Noon	astro2020_swp_Kartaltepe_J
Kashlinsky, Alexander	Goddard Space Flight Center	Electromagnetic probes of primordial black holes as dark matter	astro2020_swp_Kashlinsky_A1
Kashlinsky, Alexander	Goddard Space Flight Center	Populations behind the source-subtracted cosmic infrared background anisotropies	astro2020_swp_Kashlinsky_A2
Kasliwal, Mansi	California Institute of Technology	The Dynamic Infrared Sky	astro2020_swp_Kasliwal_M
Kastner, Joel	Rochester Institute of Technology	The Early Evolution of Stars and Exoplanet Systems: Exploring and Exploiting Nearby, Young Stars	astro2020_swp_Kastner_J
Kataria, Tiffany	Jet Propulsion Laboratory,	The Mid-Infrared Search for Biosignatures on Temperate M-Dwarf Planets	astro2020_swp_Kataria_T

	California Institute of Technology		
Kauffmann, Jens	Haystack Observatory, Massachusetts Institute of Technology	Imaging Entire Molecular Clouds in many Lines: From the Milky Way to Galaxies	astro2020_swp_Kauffmann_J1
Kauffmann, Jens	Haystack Observatory, Massachusetts Institute of Technology	Imaging Entire Molecular Clouds in many Lines: Formation of Stars and Planets	astro2020_swp_Kauffmann_J2
Kelley, Luke	Northwestern University	Multi-Messenger Astrophysics With Pulsar Timing Arrays	astro2020_swp_Kelley_L
Kieda, David	University of Utah	Science opportunities enabled by the era of Visible Band Stellar Imaging with sub-100 Î¼arc-sec angular resolution.	astro2020_swp_Kieda_D
Kierans, Carolyn	NASA/Goddard Space Flight Center	Positron Annihilation in the Galaxy	astro2020_swp_Kierans_C
Kim, Alex	Lawrence Berkeley National Laboratory	Testing Gravity Using Type Ia Supernovae Discovered by Next-Generation Wide-Field Imaging Surveys	astro2020_swp_Kim_A
Kirkpatrick, J.Davy	Caltech/IPAC	The Need for Infrared Astrometry of Brown Dwarfs in the Post-Gaia Era	astro2020_swp_Kirkpatrick_J1
Kirkpatrick, J.Davy	Caltech/IPAC	Opportunities in Time-domain Stellar Astrophysics with the NASA Near-Earth Object Camera (NEOCam)	astro2020_swp_Kirkpatrick_J2
Kishimoto, Makoto	Kyoto Sangyo University	Exploring Active Supermassive Black Holes at 100 Micro-arcsecond Resolution	astro2020_swp_Kishimoto_M
Kobelski, Adam	West Virginia University	High Frequency Solar Observing at the Green Bank Observatory	astro2020_swp_Kobelski_A
Koekemoer, Anton	Space Telescope Science Institute	Ultra Deep Field Science with WFIRST	astro2020_swp_Koekemoer_A
Kohno, Kotaro	The University of Tokyo	Exploration and characterization of the earliest epoch of galaxy formation: beyond the re-ionization era	astro2020_swp_Kohno_K
Kollmeier, Juna	Carnegie Institution for Science	Precision Stellar Astrophysics and Galactic Archeology: 2020	astro2020_swp_Kollmeier_J
Kopparapu, Ravi Kumar	NASA Goddard Space Flight Center	Exoplanet Diversity in the Era of Space-based Direct Imaging Missions	astro2020_swp_Kopparapu_R
Koss, Michael	Eureka Scientific	Black Hole Growth in Mergers and Dual AGN	astro2020_swp_Koss_M
Kovetz, Ely	Ben-Gurion University	Astrophysics and Cosmology with Line-Intensity Mapping	astro2020_swp_Kovetz_E
Kowalski, Adam	University of Colorado, National Solar Observatory	Developing a vision for exoplanetary transit spectroscopy: a shared window on the analysis of planetary atmospheres and of stellar magnetic structure	astro2020_swp_Kowalski_A

Krawczynski, Henric	Washington University in Saint Louis	Using X-Ray Polarimetry to Probe the Physics of Black Holes and Neutron Stars	astro2020_swp_Krawczynski_H
Kreckel, Kathryn	Max Planck Institute for Astronomy	Mapping Gas Phase Abundances and Enrichment Patterns Across Galaxy Disks	astro2020_swp_Kreckel_K
Krissansen-Totton, Joshua	University of Washington	Atmospheric disequilibrium as an exoplanet biosignature: Opportunities for next generation telescopes	astro2020_swp_Krissansen-Totton
Kupfer, Thomas	Kavli Insitute for Theoretical Physics / UC Santa Barbara	A Summary of Multimessenger Science with Galactic Binaries	astro2020_swp_Kupfer_T
Kurtz, Michael	Center for Astrophysics Harvard & Smithsonian	From Dark Energy to Exolife: Improving the Digital Information Infrastructure for Astrophysics	astro2020_swp_Kurtz_M
La Plante, Paul	University of Pennsylvania	Mapping Cosmic Dawn and Reionization: Challenges and Synergies	astro2020_swp_La Plante_P
Laha, Sibasish	University of California, San Diego	The physics and astrophysics of X-ray outflows from Active Galactic Nuclei.	astro2020_swp_Laha_S
Law, Casey	UC Berkeley	Radio Time-Domain Signatures of Magnetar Birth	astro2020_swp_Law_C
Lazio, Joseph	Jet Propulsion Laboratory, California Institute of Technology	Magnetic Fields of Extrasolar Planets: Planetary Interiors and Habitability	astro2020_swp_Lazio_J
Lebouteiller, Vianney	Laboratoire AIM, CEA, CNRS, Université Paris-Saclay, Université Paris Diderot, Sorbonne Paris Cité	ISM and CGM in external galaxies	astro2020_swp_Lebouteiller_V
Lee, Chien-Hsiu	NOAO	Identification and characterization of the host stars in planetary microlensing with ELTs	astro2020_swp_Lee_C
Leggett, Sandy	Gemini Observatory Northern Operations	Discovery of Cold Brown Dwarfs or Free-Floating Giant Planets Close to the Sun	astro2020_swp_Leggett_S
Lehner, Nicolas	University of Notre Dame	Following the Metals in the Intergalactic and Circumgalactic Medium over Cosmic Time	astro2020_swp_Lehner_N
Lemoine-Busserolle, Marie	Gemini Observatory	The Evolution of the Tully-Fisher Relation: Characterizing the Assembly of Rotation-Dominated Disk Galaxies over cosmic time	astro2020_swp_Lemoine-Busserolle
Leroy, Adam	Ohio State University	Physical Conditions in the Cold Gas of Local Galaxies	astro2020_swp_Leroy_A
Lesyna, Larry	LXL Technology	A Technosignature Carrying a Message Will Likely Inform us of Crucial Biological Details of Life Outside our Solar System	astro2020_swp_Lesyna_L

Leutenegger, Maurice	NASA/GSFC	The crucial role of high resolution X-ray spectroscopy in studies of massive stars and their winds	astro2020_swp_Leutenegger_M
Li, Ting	Fermi National Accelerator Laboratory	Dark Matter Physics with Wide Field Spectroscopic Surveys	astro2020_swp_Li_T
Line, Michael	Arizona State University	The Importance of Thermal Emission Spectroscopy for Understanding Terrestrial Exoplanets	astro2020_swp_Line_M
Lis, Dariusz	Caltech	D/H Ratio in Water and the Origin of Earth's Oceans	astro2020_swp_Lis_D
Lisman, Doug	Jet Propulsion Laboratory, California Institute of Technology	Surveying the solar neighborhood for ozone in the UV at temperate rocky exoplanets	astro2020_swp_Lisman_D
Littenberg, Tyson	NASA Marshall Space Flight Center	GRAVITATIONAL WAVE SURVEY OF GALACTIC ULTRA COMPACT BINARIES	astro2020_swp_Littenberg_T
Liu, Adrian	McGill University	Cosmology with the Highly Redshifted 21 cm Line	astro2020_swp_Liu_A
Lockman, Felix	Green Bank Observatory	High velocity Clouds: Building Blocks of the Local Group?	astro2020_swp_Lockman_F
Lonsdale, Colin	MIT Haystack Observatory	Studying the magnetized ISM with all-sky polarimetric radio maps	astro2020_swp_Lonsdale_C
Lopez, Eric	NASA Goddard Space Flight Center	Understanding Exoplanet Atmospheres with UV Observations II: The Far UV and Atmospheric Escape	astro2020_swp_Lopez_E
Lopez, Laura	The Ohio State University	Supernova Remnants in High Definition	astro2020_swp_Lopez_L
Lopez-Morales, Mercedes	Center for Astrophysics Harvard & Smithsonian	Detecting Earth-like Biosignatures on Rocky exoplanets around Nearby Stars with Ground-based Extremely Large Telescopes	astro2020_swp_Lopez-Morales_M
Lopez-Rodriguez, Enrique	SOFIA Science Center / NASA AMES Center	Tracing the feeding and feedback of active galaxies	astro2020_swp_Lopez-Rodriguez_E
Lorimer, Duncan	West Virginia University	Radio Pulsar Populations	astro2020_swp_Lorimer_D
Lovell, Amy	Agnes Scott College	Ground-based Observations of Small Solar System Bodies: Probing Our Local Debris Disk	astro2020_swp_Lovell_A
Lu, Jessica	UC Berkeley	From Stars to Compact Objects: The Initial-Final Mass Relation	astro2020_swp_Lu_J
Lunine, Jonathan	Cornell University	Comparing key compositional indicators in Jupiter with those in extra-solar giant planets.	astro2020_swp_Lunine_J
Lynch, Ryan	Green Bank Observatory	The Virtues of Time and Cadence for Pulsars and Fast Transients	astro2020_swp_Lynch_R
Lyra, Wladimir	California State University, Northridge	Planet formation — The case for large efforts on the computational side	astro2020_swp_Lyra_W
Maccarone, Thomas	Texas Tech University	Compact Stellar Jets	astro2020_swp_Maccarone_T1
Maccarone, Thomas	Texas Tech University	Populations of Black holes in Binaries	astro2020_swp_Maccarone_T2

Mandelbaum, Rachel	Carnegie Mellon University	Wide-field Multi-object Spectroscopy to Enhance Dark Energy Science from LSST	astro2020_swp_Mandelbaum_R
Mantz, Adam	KIPAC, Stanford University	The Future Landscape of High-Redshift Galaxy Cluster Science	astro2020_swp_Mantz_A
Margot, Jean-Luc	University of California, Los Angeles	Structure of terrestrial planets and ocean worlds	astro2020_swp_Margot_J1
Margot, Jean-Luc	University of California, Los Angeles	The radio search for technosignatures in the decade 2020—2030	astro2020_swp_Margot_J2
Marin, Frédéric	Université de Strasbourg, CNRS, Observatoire Astronomique de Strasbourg	The role of Active Galactic Nuclei in galaxy evolution: insights from space ultraviolet spectropolarimetry	astro2020_swp_Marin_F
Markevitch, Maxim	NASA GSFC	Physics of cosmic plasmas from high angular resolution X-ray imaging of galaxy clusters	astro2020_swp_Markevitch_M
Marley, Mark	NASA Ames Research Center	Imaging Cool Giant Planets in Reflected Light: Science Investigations and Synergy with Habitable Planets	astro2020_swp_Marley_M
Martin, Christopher	California Institute of Technology	IGM and CGM Emission Mapping: A New Window on Galaxy and Structure Formation	astro2020_swp_Martin_C
Martinez Pillet, Valentin	National Solar Observatory	Synoptic Studies of the Sun as a Key to Understanding Stellar Astrospheres	astro2020_swp_Martinez_Pillet_V
Matra, Luca	Center for Astrophysics Harvard & Smithsonian	Exocometary Science	astro2020_swp_Matra_L
Matsuura, Mikako	Cardiff University	Dust in supernovae: --- Do supernovae produce the first dust in the Universe? Are supernovae the key dust producers of galaxies?	astro2020_swp_Matsuura_M
Matthews, Lynn D.	Massachusetts Institute of Technology Haystack Observatory	Unlocking the Secrets of Late-Stage Stellar Evolution and Mass Loss through Radio Wavelength Imaging	astro2020_swp_Matthews_L1
Matthews, Lynn D.	Massachusetts Institute of Technology Haystack Observatory	Molecular Masers as Probes of the Dynamic Atmospheres of Dying Stars	astro2020_swp_Matthews_L1
Mazin, Ben	University of California Santa Barbara	Directly Imaging Rocky Planets from the Ground	astro2020_swp_Mazin_B
McArthur, Barbara	University of Texas at Austin	All-Sky Near Infrared Space Astrometry	astro2020_swp_McArthur_B
Mccandliss, Stephan	Johns Hopkins University	Lyman continuum observations across cosmic time: recent developments, future requirements	astro2020_swp_McCandliss_S

McConnell, Mark	University of New Hampshire / Southwest Research Institute	Prompt Emission Polarimetry of Gamma-Ray Bursts	astro2020_swp_McConnell_M
McGehee, Peregrine	College of the Canyons	Dynamical Processes in the Planet-Forming Environment	astro2020_swp_McGehee_P
McGuire, Brett	National Radio Astronomy Observatory	Closing Gaps in Our Astrochemical Heritage: From Molecular Clouds to Planets	astro2020_swp_McGuire_B1
McGuire, Brett	National Radio Astronomy Observatory	Lifting the Veil on Aromatic Chemistry: Complex Carbon Across the Stellar Life Cycle from Birth to the Afterlife	astro2020_swp_McGuire_B2
McGuire, Brett	National Radio Astronomy Observatory	Revealing Chemical Evolution Throughout the Star- Formation Process	astro2020_swp_McGuire_B3
McIntosh, Scott	NCAR/HAO	Investigating Coronal Magnetism with COSMO: Science on the Critical Path To Understanding The “Weather” of Stars and Starspheres	astro2020_swp_McIntosh_S
McWilliams, Sean	West Virginia University	The state of gravitational-wave astrophysics in 2020	astro2020_swp_McWilliams_S
Meeburg, Pieter Daniel	Kavli Institute for Cosmology, Cambridge, UK	Primordial Non-Gaussianity	astro2020_swp_Meeburg_P
Meech, Karen	Institute for Astronomy	Sampling Extrasolar Planetary Systems: Interstellar Objects in the Solar System	astro2020_swp_Meech_K
Megeath, Tom	University of Toledo	Low Mass Stars as Tracers of Star Formation in Diverse Environments	astro2020_swp_Megeath_T
Meixner, Margaret	Space Telescope Science Institute	Infrared Stellar Populations: Probing the Beginning and the End	astro2020_swp_Meixner_M
Mennesson, Bertrand	Jet Propulsion Laboratory, California Institute of Technology	Interplanetary dust around main sequence stars: origin, magnitude, and implications for exoplanet habitability searches	astro2020_swp_Mennesson_B
Metzger, Brian	Columbia University	Kilonovae: nUV/Optical/IR Counterparts of Neutron Star Binary Mergers with TSO	astro2020_swp_Metzger_B
Meyer, Eileen	University of Maryland Baltimore County (UMBC)	Prospects for AGN Studies at Hard X-ray through MeV Energies	astro2020_swp_Meyer_E
Michelson, Peter	Stanford University	Mid-Frequency-Band Space Gravitational Wave Observations for the 2020 Decade	astro2020_swp_Michelson_P
Milam, Stefanie	NASA/GSFC	Emerging Capabilities for Detection and Characterization of Near-Earth Objects (NEOs)	astro2020_swp_Milam_S
Milisavljevic, Dan	Purdue University	Achieving Transformative Understanding of Extreme Stellar Explosions with ELT-enabled Late-time Spectroscopy	astro2020_swp_Milisavljevic_D
Miller, Jon	University of Michigan	Accretion in Stellar-Mass Black Holes at High X-ray Spectral Resolution	astro2020_swp_Miller_J
Minchin, Robert	USRA	Invisible Structures in the Local Universe	astro2020_swp_Minchin_R

Mirocha, Jordan	McGill University	First Stars and Black Holes at Cosmic Dawn with Redshifted 21-cm Observations	astro2020_swp_Mirocha_J
Monnier, John	University of Michigan	The Future of Exoplanet Direct Detection	astro2020_swp_Monnier_J1
Monnier, John	University of Michigan	Imaging the Key Stages of Planet Formatio	astro2020_swp_Monnier_J2
Moulet, Arielle	USRA/SOFIA	Solar System's minor bodies: the role of the ngVLA	astro2020_swp_Moulet_A
Moustakas, Leonidas	JPL/Caltech	Quasar microlensing: Revolutionizing our understanding of quasar structure and dynamics	astro2020_swp_Moustakas_L
Mroczkowski, Tony	European Southern Observatory (ESO)	A High-resolution SZ View of the Warm-Hot Universe	astro2020_swp_Mroczkowski_T
Muirhead, Philip	Boston University	Searching for Exosatellites Orbiting L and T Dwarfs: Connecting Planet Formation to Moon Formation and Finding New Temperate Worlds	astro2020_swp_Muirhead_P
Mukherjee, Reshmi	Barnard College, Columbia University	Exploring Frontiers in Physics with Very-High-Energy Gamma Rays	astro2020_swp_Mukherjee_R
Murphy, Eric	National Radio Astronomy Observatory	Unsolved Problems in Modern Astrophysics: Anomalous Microwave Emission	astro2020_swp_Murphy_E1
Murphy, Eric	National radio Astronomy Observatory	Robustly Mapping the Distribution of Star Formation in High- z Galaxies	astro2020_swp_Murphy_E2
Murphy, Eric	National Radio Astronomy Observatory	Towards a Theory for Star Formation on All Scales	astro2020_swp_Murphy_E3
Natarajan, Priyamvada	Yale University	Disentangling nature from nurture: tracing the origin of seed black holes	astro2020_swp_Natarajan_P
Neiner, Coralie	LESIA, Paris Observatory, France	Stellar physics with high-resolution UV spectropolarimetry	astro2020_swp_Neiner_C
Ness, Melissa	Columbia/Flatiron University of Maryland,	In Pursuit of Galactic Archaeology	astro2020_swp_Ness_M
Neveu, Marc	College Park / NASA Goddard Space Flight Center	Investigating the Solar System's Ocean Worlds with Next-Generation Space Telescopes	astro2020_swp_Neveu_M
Newman, Andrew	Carnegie Institution for Science	Resolving Galaxy Formation at Cosmic Noon	astro2020_swp_Newman_A
Newman, Jeffrey	University of Pittsburgh and PITT PACC	Deep Multi-object Spectroscopy to Enhance Dark Energy Science from LSST	astro2020_swp_Newman_J
Nisa, Mehr	University of Rochester	The Sun at GeV--TeV Energies: A New Laboratory for Astroparticle Physics	astro2020_swp_Nisa_M
Ntampaka, Michelle	Harvard Data Science Initiative; Center for	The Role of Machine Learning in the Next Decade of Cosmology	astro2020_swp_Ntampaka_M

	Astrophysics Harvard & Smithsonian		
Nyland, Kristina	NRC, resident at NRL	AGN Feedback Driven by Jet-ISM Interactions on Sub-Galactic Scales: Opportunities for Advancement in the Next Decade	astro2020_swp_Nyland_K
Oberg, Karin	Harvard University	Astrochemical Origins of Planetary Systems	astro2020_swp_Oberg_K
Ojha, Roopesh	UMBC/NASA GSFC	Neutrinos, Cosmic Rays, and the MeV Band	astro2020_swp_Ojha_R
Olsen, Knut	National Optical Astronomy Observatory	Science Platforms for Resolved Stellar Populations in the Next Decade	astro2020_swp_Olsen_K
Oppenheimer, Benjamin	University of Colorado, Boulder	Imprint of Drivers of Galaxy Formation in the Circumgalactic Medium	astro2020_swp_Oppenheimer_B
Orlando, Elena	Kavli Institute for Particle Astrophysics and Cosmology and Hansen Experimental Physics Laboratory, Stanford University	Cosmic Rays and interstellar medium with Gamma- Ray Observations at MeV Energies	astro2020_swp_Orlando_E
Orlowski- Scherer, John	University of Pennsylvania	Characterizing Extra-solar Oort Clouds with Submillimeter-wave Observations	astro2020_swp_Orlowski-Scherer_J
Osten, Rachel	Space Telescope Science Institute, Johns Hopkins University	Advancing Understanding of Star-Planet Ecosystems in the Next Decade: The Radio Wavelength Perspective	astro2020_swp_Osten_R1
Osten, Rachel	Space Telescope Science Institute, Johns Hopkins University	Stellar X-ray Spectroscopy Addresses Fundamental Physics of Stellar Coronae, Accretion, and Winds, and Informs Stellar and Planetary Studies	astro2020_swp_Osten_R2
Overzier, Roderik	Observatório Nacional / Institute of Astronomy, Geophysics and Atmospheric Sciences, University of São Paulo	Tracing the formation history of galaxy clusters into the epoch of reionization	astro2020_swp_Overzier_R
Pacucci, Fabio	Kapteyn Astronomical Institute, Yale University	Detecting the Birth of Supermassive Black Holes Formed from Heavy Seeds	astro2020_swp_Pacucci_F
Paladini, Roberta	Caltech-IPAC	On the Origins of the Initial Mass Function	astro2020_swp_Paladini_R

Palmese, Antonella	Fermi National Accelerator Laboratory	Gravitational wave cosmology and astrophysics with large spectroscopic galaxy surveys	astro2020_swp_Palmese_A
Papovich, Casey	Texas A&M University	UV Diagnostics of Galaxies from the Peak of Star-Formation to the Epoch of Reionization	astro2020_swp_Papovich_C
Pasham, Dheeraj	Massachusetts Institute of Technology	Probing the Cosmological Evolution of Super-massive Black Holes using Tidal Disruption Flares	astro2020_swp_Pasham_D
Peeples, Molly	Space Telescope Science Institute / Johns Hopkins University	Understanding the circumgalactic medium is critical for understanding galaxy evolution	astro2020_swp_Peeples_M
Pellegrini, Eric	University of Heidelberg	Making the Connection between Feedback and Spatially Resolved Emission Line Diagnostics	astro2020_swp_Pellegrini_E
Penny, Matthew	The Ohio State University	Measurement of the Free-Floating Planet Mass Function with Simultaneous Euclid and WFIRST Microlensing Parallax Observations	astro2020_swp_Penny_M
Perez, Kerstin	Massachusetts Institute of Technology	Cosmic-ray Antinuclei as Messengers for Dark Matter	astro2020_swp_Perez_K
Perlman, Eric	Florida Institute of Technology	Relativistic Jets in the Accretion & Collimation Zone : New Challenges Enabled by New Instruments	astro2020_swp_Perlman_E1
Perlman, Eric	Florida Institute of Technology	Kiloparsec-scale Jets: Physics, Emission Mechanisms, and Challenges	astro2020_swp_Perlman_E1
Perlmutter, Saul	UC Berkeley / LBNL	The Key Role of Supernova Spectrophotometry in the Next-Decade Dark Energy Science Program	astro2020_swp_Perlmutter_S
Petric, Andreea	Institute for Astronomy	High Redshift Obscured Quasars and the Need for Optical to NIR, Massively Multiplexed, Spectroscopic Facilities	astro2020_swp_Petric_A
Pevtsov, Alexei	NATIONAL SOLAR OBSERVATORY	Historical astronomical data: urgent need for preservation, digitization enabling scientific exploration	astro2020_swp_PEVTSOV_A
Pierce, Michael	University of Wyoming	Transverse Extragalactic Motions: a New Method for Constraining Cosmological Parameters	astro2020_swp_Pierce_M1
Pierce, Michael	University of Wyoming	Characterizing the Assembly of Galaxy Cluster Populations Over Cosmic time	astro2020_swp_Pierce_M2
Pineda, Jorge L.	Jet Propulsion Laboratory, California Institute of Technology	Probing Galaxy Evolution through Far- Infrared Spectroscopy of the Interstellar Medium.	astro2020_swp_Pineda_J
Pisani, Alice	Princeton University	Cosmic voids: a novel probe to shed light on our Universe	astro2020_swp_Pisani_A
Pisano, D.J.	West Virginia University	Completing the Hydrogen Census in the Circumgalactic Medium at $z \sim 0$	astro2020_swp_Pisano_D
Plavchan, Peter	George Mason University	Community Endorsement of the National Academies Exoplanet Science Strategy and Astrobiology Strategy for the Search for Life in the Universe Reports	astro2020_swp_Plavchan_P
Plotkin, Richard	University of Nevada, Reno	Local Constraints on Supermassive Black Hole Seeds	astro2020_swp_Plotkin_R

Pontoppidan, Klaus	Space Telescope Science Institute	The trail of water and the delivery of volatiles to habitable planets	astro2020_swp_Pontoppidan_K
Pooley, David	Trinity University	The Most Powerful Lenses in the Universe: Quasar Microlensing as a Probe of the Lensing Galaxy	astro2020_swp_Pooley_D
Pope, Alexandra	University of Massachusetts Amherst	Simultaneous Measurements of Star Formation and Supermassive Black Hole Growth in Galaxies	astro2020_swp_Pope_A
Price, Sara	Harvard-Smithsonian Center for Astrophysics	Picturing a Panchromatic Past and Future	astro2020_swp_Price_S
Price-Whelan, Adrian	Princeton University	Stellar multiplicity: an interdisciplinary nexus	astro2020_swp_Price-Whelan_A
Rackham, Benjamin	University of Arizona	Constraining Stellar Photospheres as an Essential Step for Transmission Spectroscopy of Small Exoplanets	astro2020_swp_Rackham_B
Rahmani, Hadi	Paris Observatory	Quasar absorption lines as astrophysical probes of fundamental physics and cosmology	astro2020_swp_Rahmani_H
Ramirez, Ramses	Earth-Life Science Institute (ELSI), Tokyo Institute of Technology	Habitable zone predictions and how to test them	astro2020_swp_Ramirez_R
Rani, Bindu	NASA Goddard Space Flight Center, USA	High-Energy Polarimetry - a new window to probe extreme physics in AGN jets	astro2020_swp_Rani_B1
Rani, Bindu	NASA Goddard Space Flight Center, USA	Multi-Physics of AGN Jets in the Multi-Messenger Era	astro2020_swp_Rani_B2
Rankin, Joanna	University of Vermont	A Plasma-Physical Understanding of Pulsar Radio Emission Physics	astro2020_swp_Rankin_J
Rau, Gioia	NASA/GSFC & CUA	Cool, evolved stars: results, challenges, and promises for the next decade	astro2020_swp_Rau_G
Ravi, Vikram	Center for Astrophysics Harvard & Smithsonian; Caltech	Fast Radio Burst Tomography of the Unseen Universe	astro2020_swp_Ravi_V
Ravindranath, Swara	Space Telescope Science Institute	Spatially-resolved studies of star-forming galaxies in the reionization epoch	astro2020_swp_Ravindranath_S
Rayner, John	IRTF/University of Hawaii	Astrophysics with the NASA Infrared Telescope Facility	astro2020_swp_Rayner_J
Reach, William	USRA	Far-Infrared studies of Galaxy Evolution	astro2020_swp_Reach_W
Reid, Mark	Center for Astrophysics Harvard & Smithsonian	Science Opportunities with Long Baseline Radio Interferometry and Micro-arcsecond Astrometry	astro2020_swp_Reid_M
Reinhard, Christopher	Georgia Institute of Technology	The remote detectability of Earth's biosphere through time and the importance of UV capability for characterizing habitable exoplanets	astro2020_swp_Reinhard_C

Reitze, David	California Institute of Technology	The US Program in Ground-Based Gravitational Wave Science: Contribution from the LIGO Laboratory	astro2020_swp_Reitze_D
Remijan, Anthony	National Radio Astronomy Observatory	OBSERVATIONAL ASTROCHEMISTRY IN THE NEXT DECADE	astro2020_swp_Remijan_A
Reynolds, Christopher	University of Cambridge	High-Energy Astrophysics in the 2020s and Beyond	astro2020_swp_Reynolds_C
Rho, Jeonghee	SETI Institute	Are Supernovae the Dust Producer in the Early Universe?	astro2020_swp_Rho_J
Rhodes, Jason	Jet Propulsion Laboratory, California Institute of Technology	Cosmological Synergies Enabled by Joint Analysis of Multi-probe data from WFIRST, Euclid, and LSST	astro2020_swp_Rhodes_J1
Rhodes, Jason	Jet Propulsion Laboratory, California Institute of Technology	The End of Galaxy Surveys	astro2020_swp_Rhodes_J2
Rich, R. Michael	Department of Physics and Astronomy, UCLA	The Chemical/Dynamical Evolution of the Galactic Bulge	astro2020_swp_Rich_R
Ridgway, Stephen	NOAO	Precision Analysis of Evolved Stars	astro2020_swp_Ridgway_S
Rieke, George	University of Arizona	JWST/MIRI Surveys in GOODS-S	astro2020_swp_Rieke_G
Rieke, Marcia	University of Arizona	JWST GTO/ERS Deep Surveys	astro2020_swp_Rieke_M
Rigby, Jane	NASA Goddard Space Flight Center	The production and escape of ionizing photons from galaxies over cosmic time	astro2020_swp_Rigby_J
Rix, Hans-Walter	Max Planck Institute for Astronomy, Heidelberg	Binaries Matter Everywhere: from Precision Calibrations to Re-Ionization and Gravitational Waves	astro2020_swp_Rix_H
Robertson, Brant	UC Santa Cruz and Institute for Advanced Study	Understanding Galaxy Formation via Near-Infrared Surveys in the 2020s	astro2020_swp_Robertson_B
Robinson, Tyler	Northern Arizona University	Characterizing Exoplanet Habitability	astro2020_swp_Robinson_T
Roederer, Ian	University of Michigan	The First Stars and the Origin of the Elements	astro2020_swp_Roederer_I1
Roederer, Ian	University of Michigan	The Potential of Ultraviolet Spectroscopy to Open New Frontiers to Study the First Stars	astro2020_swp_Roederer_I2
Roederer, Ian	University of Michigan	The astrophysical r-process and the origin of the heaviest elements	astro2020_swp_Roederer_I3
Roettenbacher, Rachael	Yale University	High Angular Resolution Astrophysics: Resolving Stellar Surface Features	astro2020_swp_Roettenbacher_R

Roman-Duval, Julia	Space Telescope Science Institute	Metal Abundances and Depletions in the Neutral Interstellar Medium of Galaxies: the Local Volume as a Laboratory	astro2020_swp_Roman-Duval_J
Ross, Nicholas	University of Edinburgh	Opportunities in Time-Domain Extragalactic Astrophysics with the NASA Near-Earth Object Camera (NEOCam)	astro2020_swp_Ross_N
Rudie, Gwen C.	Carnegie Institution for Science	Observing Galaxies and Dissecting their Baryon Cycle at Cosmic Noon	astro2020_swp_Rudie_G
Ruszkowski, Mateusz	University of Michigan in Ann Arbor	Supermassive Black Hole Feedback	astro2020_swp_Ruszkowski_M
Ryan, Russell	Space Telescope Science Institute	The WFIRST Deep Grism Survey: WDGs	astro2020_swp_Ryan_R
Rymer, Abigail	JHUAPL	Solar System Ice Giants: Exoplanets in our Backyard.	astro2020_swp_Rymer_A
Sadavoy, Sarah	Harvard-Smithsonian Center for Astrophysics	The Life Cycle of Dust	astro2020_swp_Sadavoy_S
Safi-Harb, Samar	University of Manitoba	High-Resolution X-ray Imaging Studies of Neutron Stars, Pulsar Wind Nebulae and Supernova Remnants	astro2020_swp_Safi-Harb_S
Sahai, Raghvendra	Jet Propulsion Laboratory, California Institute of Technology	Probing Strong Binary Interactions and Accretion in Asymptotic Giant Branch Stars	astro2020_swp_Sahai_R
Sallum, Steph	University of California, Santa Cruz	Imaging Giant Protoplanets with the ELTs	astro2020_swp_Sallum_S
Salter, Christopher	Green Bank Observatory	Radio Scintillation Studies of Comet Ion Tails	astro2020_swp_Salter_C1
Salter, Christopher	Green Bank Observatory & Arecibo Observatory	Secular Transient Radio Sources	astro2020_swp_Salter_C2
Sanderson, Robyn	University of Pennsylvania / Flatiron Institute	The Multidimensional Milky Way	astro2020_swp_Sanderson_R
Santander, Marcos	University of Alabama	A Unique Messenger to Probe Active Galactic Nuclei: High-Energy Neutrinos	astro2020_swp_Santander_M
Sarazin, Fred	Colorado School of Mines	What is the nature and origin of the highest-energy particles in the universe?	astro2020_swp_Sarazin_F
Sathnur, Ashwini	United Nations Development Programme	Solar flares and Quantum Neural Networks	astro2020_swp_Sathnur_A
Sathyaprakash, Bangalore	The Pennsylvania State University	EXTREME GRAVITY AND FUNDAMENTAL PHYSICS	astro2020_swp_Sathyaprakash_B1
Sathyaprakash, Bangalore	The Pennsylvania State University	COSMOLOGY AND THE EARLY UNIVERSE	astro2020_swp_Sathyaprakash_B2

Sathyaprakash, Bangalore	The Pennsylvania State University	MULTIMESSENGER UNIVERSE with GRAVITATIONAL WAVES from BINARY SYSTEMS	astro2020_swp_Sathyaprakash_B3
Savin, Daniel Wolf	Columbia University	Astrophysical Science enabled by Laboratory Astrophysics Studies in Atomic, Molecular, and Optical (AMO) Physics	astro2020_swp_Savin_D
Schaefer, Gail	The CHARA Array of Georgia State University	Binary and Multiple Star Systems at High Angular Resolution	astro2020_swp_Schaefer_G1
Schaefer, Gail	The CHARA Array of Georgia State University	High Angular Resolution Astrophysics in the Era of Time Domain Surveys	astro2020_swp_Schaefer_G2
Schroeder, Frank	Bartol Research Institute, Department of Physics and Astronomy, University of Delaware, Newark, DE, USA	High-Energy Galactic Cosmic Rays	astro2020_swp_Schroeder_F
Schussler, Fabian	IRFU, CEA Paris-Saclay	All-Sky time domain astrophysics with Very High Energy Gamma rays	astro2020_swp_Schussler_F
Scolnic, Daniel	Duke University	The Next Generation of Cosmological Measurements with Type Ia Supernovae	astro2020_swp_Scolnic_D
Scowen, Paul	Arizona State University	Outline of Analysis Studies Conducted by NASA Cosmic Origins Program Analysis Group Members During the Past 10 Years	astro2020_swp_Scowen_P
Sehgal, Neelima	Stony Brook University	Science from an Ultra-Deep, High-Resolution Millimeter-Wave Survey	astro2020_swp_Sehgal_N
Sembach, Ken	Space Telescope Science Institute	The Search for Life Elsewhere as a Compelling Science Theme for Astro2020	astro2020_swp_Sembach_K
Shandera, Sarah	The Pennsylvania State University	Probing the origin of our Universe through cosmic microwave background constraints on gravitational waves	astro2020_swp_Shandera_S
Shao, Michael	Jet Propulsion Laboratory, California Institute of Technology	Finding Exo-Earths with Precision Space Astrometry	astro2020_swp_Shao_M
Shawhan, Peter	University of Maryland and Joint Space-Science Institute	Multi-Messenger Astrophysics Opportunities with Stellar-Mass Binary Black Hole Mergers	astro2020_swp_Shawhan_P
Sheehan, Patrick	National Radio Astronomy Observatory	Protostellar Disks: The Missing Link Between Cores and Planets	astro2020_swp_Sheehan_P
Sheikh, David	ZeCoat Corporation	Method to aluminum-coat telescope mirrors in space for EUV-broadband astronomy	astro2020_swp_sheikh_d
Shen, Yue	University of Illinois	Mapping the Inner Structure of Quasars with Time-Domain Spectroscopy	astro2020_swp_Shen_Y

Shoemaker, David	Massachusetts Institute of Technology	Gravitational wave astronomy with LIGO and similar detectors in the next decade	astro2020_swp_Shoemaker_D1
Shoemaker, David	MIT	Gravitational-Wave Astronomy in the 2020s and Beyond: A view across the gravitational wave spectrum	astro2020_swp_Shoemaker_D2
Siemens, Xavier	University of Wisconsin -- Milwaukee Center for Astrophysics Harvard & Smithsonian	Physics Beyond the Standard Model With Pulsar Timing Arrays	astro2020_swp_Siemens_X
Siemiginowska, Aneta	Center for Astrophysics Harvard & Smithsonian	The Next Decade of Astroinformatics and Astrostatistics	astro2020_swp_Siemiginowska_A
Simon, Joshua	Carnegie Observatories	Testing the Nature of Dark Matter with Extremely Large Telescopes	astro2020_swp_Simon_J1
Simon, Joshua	Carnegie Observatories	Dynamical Masses for a Complete Census of Local Dwarf Galaxies	astro2020_swp_Simon_J2
Simon, Robert	Universitaet zu Koeln	The Cycling of Matter from the Interstellar Medium to Stars and back	astro2020_swp_Simon_R
Slosar, Anze	Brookhaven National Laboratory	Dark Energy and Modified Gravity	astro2020_swp_Slosar_A1
Slosar, Anze	Brookhaven National Laboratory	Scratches from the Past: Inflationary Archaeology through Features in the Power Spectrum of Primordial Fluctuations	astro2020_swp_Slosar_A2
Smith, J.D.	University of Toledo	The Chemical Enrichment History of the Universe	astro2020_swp_Smith_J
Snios, Bradford	Center for Astrophysics Harvard & Smithsonian	X-rays Studies of the Solar System	astro2020_swp_Snios_B
Stanghellini, Letizia	National Optical Astronomy Observatory	Radial Metallicity Gradients in Star-Forming Galaxies	astro2020_swp_Stanghellini_L
Stanke, Thomas	ESO	The warm and dense Galaxy - tracing the formation of dense cloud structures out to the Galactic Center	astro2020_swp_Stanke_T
Stark, Christopher	Space Telescope Science Institute	Optimal Architectures and Survey Designs for Maximizing the Yields of Direct-Imaging Exoplanet Missions	astro2020_swp_Stark_C
Stauffer, John	Caltech/IPAC	The IMF at Very Low Mass Using Near-IR Surveys from Space: The Need for Deep K-band Imaging	astro2020_swp_Stauffer_J
Steiner, James F	MIT	Accretion Physics with Fast X-ray Spectral Timing	astro2020_swp_Steiner_J
Stephens, Ian	CfA/SAO	Polarization in Disks	astro2020_swp_Stephens_I
Stinebring, Dan R.	Oberlin College	Twelve Decades: Probing the Interstellar Medium from kiloparsec to sub-AU scales	astro2020_swp_Stinebring_D
Su, Kate	Steward Observatory, University of Arizona	Probing Unseen Planet Populations with Resolved Debris Disk Structures	astro2020_swp_Su_K
Su, Yuanyuan	University of Kentucky	A Unification of the Micro and Macro Physics in the Intracluster Medium of Nearby Clusters	astro2020_swp_Su_Y

Suntzeff, Nicholas B.	Mitchell Institute for Fundamental Physics & Astronomy, Texas A&M University	The Cusp of Discovery in Astronomy	astro2020_swp_Suntzeff_N
Tanvir, Nial	University of Leicester	GRBs as Probes of the Early Universe with TSO	astro2020_swp_Tanvir_N
Taylor, Patrick	Lunar and Planetary Institute California	Planetary Radar Astronomy with Ground-Based Astrophysical Assets	astro2020_swp_Taylor_P
Taylor, Stephen	Institute of Technology	Supermassive Black-hole Demographics & Environments With Pulsar Timing Arrays	astro2020_swp_Taylor_S1
Taylor, Stuart F.	Participation Worldscape	Characterizing the Distribution of Parameters of Planets Found by Radial Velocity is Essential for Understanding Planet Formation and Evolution	astro2020_swp_Taylor_S2
Thilker, David	Johns Hopkins University	The Nature of Low-Density Star Formation	astro2020_swp_Thilker_D
Timmes, Frank	Arizona State University	Catching Element Formation In The Act ; The Case for a New MeV Gamma-Ray Mission: Radionuclide Astronomy in the 2020s	astro2020_swp_Timmes_F
Tinto, Massimo	University of California San Diego, Center for Astrophysics and Space Sciences	Space-Based Gravitational Wave Observations in the Mid-Band Frequency Region	astro2020_swp_Tinto_M
Tkachenko, Andrew	Institute of Astronomy, KU Leuven	Gravity-wave asteroseismology of intermediate- and high-mass stars	astro2020_swp_Tkachenko_A
Tobin, John	National Radio Astronomy Observatory	The Formation and Evolution of Multiple Star Systems	astro2020_swp_Tobin_J1
Tobin, John	National Radio Astronomy Observatory	Measuring Protostar Masses: The Key to Protostellar Evolution	astro2020_swp_Tobin_J2
Toloza, Odette	University of Warwick	Understanding the evolution of close white dwarf binaries	astro2020_swp_Toloza_O
Tombesi, Francesco	University of Maryland, College Park	Do Supermassive Black Hole Winds Impact Galaxy Evolution?	astro2020_swp_Tombesi_F
Tremblay, Grant	Center for Astrophysics Harvard & Smithsonian	Galaxy Winds in the Age of Hyperdimensional Astrophysics	astro2020_swp_Tremblay_G
Trilling, David	Northern Arizona University	Origins Survey of Primordial Relics: ELTs Reveal Compositional Variation across the Solar System	astro2020_swp_Trilling_D
Tripp, Todd	University of Massachusetts - Amherst	On The Unique Value of Spectroscopy in the Deep Ultraviolet for Galaxy Evolution Studies	astro2020_swp_Tripp_T
Tumlinson, Jason	STScI / JHU	The Baryon Cycle, Resolved: A New Discovery Space for UV Spectroscopy	astro2020_swp_Tumlinson_J

Turyshev, Slava	Jet Propulsion Laboratory, California Institute of Technology	Direct Multi-Pixel Imaging and Spatially-Resolved Spectroscopy of a Potentially Habitable Exoplanet with the Solar Gravitational Lens	astro2020_swp_Turyshev_S
Tuttle, Sarah	University of Washington, Seattle	Mapping the CGM in Emission	astro2020_swp_Tuttle_S
Tzeferacos, Petros	University of Chicago	Astrophysical magnetized turbulence and turbulent dynamo in laser-driven plasma experiments	astro2020_swp_Tzeferacos_P
Uzdensky, Dmitri	University of Colorado Boulder	Extreme Plasma Astrophysics	astro2020_swp_Uzdensky_D
Valencic, Lynne	Johns Hopkins University	Probing the Structure of Interstellar Dust from Micron to Kpc Scales with X-ray Imaging	astro2020_swp_Valencic_L
Van Belle, Gerard	Lowell Observatory	High Angular Resolution Astrophysics: Fundamental Stellar Parameters	astro2020_swp_van_Belle_G
Van Der Marel, Nienke	NRC Herzberg Astronomy & Astrophysics programs	Dust growth and dust trapping in protoplanetary disks with the ngVLA	astro2020_swp_van_der_Marel_N
Vandenbroucke, Justin	University of Wisconsin	Multi-messenger and transient astrophysics with very-high-energy gamma rays	astro2020_swp_Vandenbroucke_J
Venters, Tonia	NASA Goddard Space Flight Center	Energetic Particles of Cosmic Accelerators I: Galactic Accelerators	astro2020_swp_Venters_T1
Venters, Tonia	NASA Goddard Space Flight Center	Energetic Particles of Cosmic Accelerators II: Active Galactic Nuclei and Gamma-ray Bursts	astro2020_swp_Venters_T2
Viana, Aion	Instituto de Física de São Carlos, Universidade de São Paulo, Brazil	Searching for TeV Dark Matter in the Milky Way Galactic Center	astro2020_swp_Viana_A
Vieregg, Abigail	University of Chicago	Astrophysics Uniquely Enabled by Observations of High-Energy Cosmic Neutrinos	astro2020_swp_Vieregg_A1
Vieregg, Abigail	University of Chicago	Fundamental Physics with High-Energy Cosmic Neutrinos	astro2020_swp_Vieregg_A2
Voit, Mark	Michigan State University	Circumgalactic Gas and the Precipitation Limit	astro2020_swp_Voit_M
Vos, Johanna	American Museum of Natural History	The L/T Transition	astro2020_swp_Vos_J
Vulic, Neven	NASA Goddard Space Flight Center	Time Domain Studies of Neutron Star and Black Hole Populations: X-ray Identification of Compact Object Types	astro2020_swp_Vulic_N
Wadiasingh, Zorawar	NASA Goddard Space Flight Center	Magnetars as Astrophysical Laboratories of Extreme Quantum Electrodynamics: The Case for a Compton Telescope	astro2020_swp_Wadiasingh_Z
Walker, Stephen	NASA Goddard Space Flight Center	Unveiling the Galaxy Cluster - Cosmic Web Connection with X-ray observations in the Next Decade	astro2020_swp_Walker_S
Walter, Fabian	MPIA/NRAO	The evolution of the cosmic molecular gas density	astro2020_swp_Walter_F

Wang, Ji	The Ohio State University	New Frontiers for Terrestrial-sized to Neptune-sized Exoplanets In the Era of Extremely Large Telescopes	astro2020_swp_Wang_J
Wang, Lifan	Texas A&M University	JWST: Probing the Epoch of Reionization with a Wide Field Time-Domain Survey	astro2020_swp_Wang_L
Wang, Q. Daniel	University of Massachusetts Amherst	The Panchromatic Circumgalactic Medium	astro2020_swp_Wang_Q
Wang, Yun	California Institute of Technology	Illuminating the dark universe with a very high density galaxy redshift survey over a wide area	astro2020_swp_Wang_Y
Weinberger, Alycia	Carnegie DTM	A Strategy for Understanding Planet Formation	astro2020_swp_Weinberger_A
Weisz, Daniel	University of California, Berkeley	Near-Field Cosmology with the Lowest-Mass Galaxies	astro2020_swp>Weisz_D
Wheeler, J. Craig	The University of Texas at Austin	ELT Contributions to Tidal Disruption Events	astro2020_swp_Wheeler_J1
Wheeler, J. Craig	The University of Texas at Austin	ELT Contributions to The First Explosions	astro2020_swp_Wheeler_J2
White, Stephen	Air Force Research Laboratory	The Importance of Synoptic Solar Radio Observations	astro2020_swp_White_S
Williams, Benjamin	University of Washington	Far Reaching Science with Resolved Stellar Populations in the 2020s	astro2020_swp_Williams_B1
Williams, Brian	NASA GSFC	Future X-ray Studies of Supernova Remnants	astro2020_swp_Williams_B2
Williams, David	University of California Santa Cruz	Probing Extreme Environments with Very-High-Energy Gamma Rays	astro2020_swp_Williams_D
Windhorst, Rogier	Arizona State University	On the observability of individual Population III stars and their stellar-mass black hole accretion disks through cluster caustic transits	astro2020_swp_Windhorst_R
Wolf, Eric	University of Colorado	The Importance of 3D General Circulation Models for Characterizing the Climate and Habitability of Terrestrial Extrasolar Planets.	astro2020_swp_Wolf_E
Wolff, Michael	Space Science Division, Naval Research Laboratory	The Physics of Accretion Onto Highly Magnetized Neutron Stars	astro2020_swp_Wolff_M
Wolk, Scott	Smithsonian Astrophysical Observatory	Understanding Galactic Star Formation with Next Generation X-ray Spectroscopy and Imaging	astro2020_swp_Wolk_S1
Wolk, Scott	Smithsonian Astrophysical Observatory	X-ray Studies of Exo&SS	astro2020_swp_Wolk_S2
Wong, Michael H.	UC Berkeley	Solar system Deep Time-Surveys of atmospheres, surfaces, and rings	astro2020_swp_Wong_M
Wood-Vasey, Michael	University of Pittsburgh	Type Ia Supernova Cosmology with TSO	astro2020_swp_Wood-Vasey_M
Wright, Jason	Penn State University	Searches for Technosignatures in Astronomy and Astrophysics	astro2020_swp_Wright_J1

Wright, Jason	Penn State University	Technosignatures in the Thermal Infrared	astro2020_swp_Wright_J2
Wright, Jason	Penn State University	Technosignatures in Transit	astro2020_swp_Wright_J3
Wrobel, Joan	National Radio Astronomy Observatory	Intermediate-Mass Black Holes in Extragalactic Globular Clusters	astro2020_swp_Wrobel_J
Yan, Huirong	DESY & University of Potsdam	Precision measurement of magnetic field from near to far, from fine to large scales in ISM	astro2020_swp_Yan_H
Yee, Jennifer	Center for Astrophysics Harvard & Smithsonian	The Scientific Context of WFIRST, Microlensing in the 2020s	astro2020_swp_Yee_J
Yoachim, Peter	University of Washington	LSST Narrowband Filters	astro2020_swp_Yoachim_P
Youngblood, Allison	NASA Goddard Space Flight Center	EUV influences on exoplanet atmospheric stability and evolution	astro2020_swp_Youngblood_A1
Youngblood, Allison	NASA Goddard Space Flight Center	EUV observations of cool dwarf stars	astro2020_swp_Youngblood_A2
Yu, Nan	Jet Propulsion Laboratory	Exploring Dark Energy and Gravity in Space Laboratories	astro2020_swp_Yu_N
Zaritsky, Dennis	University of Arizona	Emission Line Mapping of the Circumgalactic Medium of Nearby Galaxies	astro2020_swp_Zaritsky_D
Zasowski, Gail	University of Utah	High-Dimensional Dust Mapping	astro2020_swp_Zasowski_G
Zellem, Robert	Jet Propulsion Laboratory, California Institute of Technology	Engaging Citizen Scientists to Keep Transit Times Fresh and Ensure the Efficient Use of Transiting Exoplanet Characterization Missions	astro2020_swp_Zellem_R
Zemcov, Michael	Rochester Institute of Technology	Opportunities for Astrophysical Science from the Inner and Outer Solar System	astro2020_swp_Zemcov_M
Zezas, Andreas	Center for Astrophysics Harvard & Smithsonian	X-ray binaries: laboratories for understanding the evolution of compact objects from their birth to their mergers	astro2020_swp_Zezas_A
Zingale, Michael	Stony Brook University	MMA SAG: Thermonuclear Supernovae	astro2020_swp_Zingale_M
Zoghbi, Abderahmen	University of Michigan	Supermassive Black Hole Spin and Reverberation	astro2020_swp_Zoghbi_A