# **NR**

#### [Leahy and Dechow] Second, framing all private entities as unjust IGNORES the progress Black people have made in space.

**Leahy and Dechow**: Anna Leahy and Douglas R. Dechow are the authors of "Generation Space: A Love Story," scheduled for publication by Stillhouse Press in April 2017. Their collaborative writings on aviation, space, and technology have appeared in TheAtlantic.com, Air & Space Magazine, Fifth Wednesday Journal, and Curator. They teach at Chapman University in Orange, California. “What Everyone Gets Wrong about Black History in the Space Age” *Scientific American,* 2017. JP

A few weeks ago, Hidden Figures, the story about African-American women who helped get Apollo astronauts to the Moon, was overtaking and holding the box office lead. This real-life story of Black history in the Space Age supplanted the science fiction space adventure Rogue One and is holding its own, which should be no surprise. But the story and its success is a surprise. Hidden Figures revealed a part of NASA history that had been left out of the story we usually tell about the Space Age. Space exploration has been about people as well as about machines, and Katherine Johnson, Dorothy Vaughn, and Mary Jackson didn’t make it into the history books until recently. History books got that wrong, until now. At the same time this film was telling this eye-opening story of Black history, the Huffington Post, Yahoo!, Economic Times, and others ran stories about the first African-American International Space Station crew member, who is scheduled to launch for an extended stint aboard the station in 2018. These and other media outlets claimed that Jeanette Epps will be the first African-American sent to the space station or to board ISS. The media got that wrong. ADVERTISEMENT This is probably due to a misunderstanding about how ISS crew rotation works. Reporters, likely unfamiliar with space exploration, probably didn't bother to look carefully at the announcement on NASA's website, or didn't understand the difference between an Expedition crew aboard the space station and a Soyuz or Shuttle crew going to the space station. The shuttle flew to the International Space Station (ISS) for years, carrying astronauts back and forth on short missions of a week or two to deliver supplies or to help with repairs. Some members of those shuttle crews joined a space station crew to stay aboard for longer stints. These longer-term Expedition crews were formed in a carefully orchestrated scheduled of overlaps and swap-outs that’s been going on since November 2, 2000. **Just as many of us are surprised to know that African-American women mathematicians were calculating spacecraft trajectories fifty years ago, we might mistakenly assume that African-Americans have not been actively contributing to space exploration as astronauts these last thirty years**. Epps will fly up as part of a Soyuz crew and remain as part of an Expedition crew, and that is a terrific first. But she won’t be the first African-American to float through the hatch into ISS. African-American astronaut Stephanie Wilson flew to and boarded ISS three separate times over four years. In 2007, Wilson was part of the STS-120 shuttle crew that also included Daniel Tani. She returned to Earth Mark Hamill’s light saber from Star Wars, which had been carried aboard for the film’s thirtieth anniversary. Tani, on the other hand, became part of the space station’s sixteenth Expedition. He stayed on orbit almost four months and had no way to return home to be with his family when his mother died. That’s among the risks Epps will face in 2018: the inability to return home any time soon. To be sure, all the humans who went to the moon were white men. Even in the early days of America’s space programs, however, Ed Dwight was picked as an astronaut candidate. He faced harsh racism and, after the assassination of President Kennedy, decided not to join the astronaut corps. **Though he never flew to space either, Robert Henry Lawrence Jr. became the first Black astronaut in 1967, when he joined the Manned Orbital Laboratory program, a sort of spy-in-the-sky idea**. By the time that program was cancelled and some of its astronauts switched to NASA, Lawrence had died when his ejection seat malfunctioned during an aborted test flight of a supersonic aircraft at Edwards Air Force Base. In the wake of these small first steps, the astronaut group chosen in 1978 became the giant leap forward for NASA that shaped the space shuttle crews and future astronaut selection for decades to come. **As NASA moved toward the first shuttle launch, this class included six women, an Asian-American man, and three African-American men**: Guion Bluford Jr., Ronald McNair, and Frederick Gregory. In 1983, on the eighth shuttle mission, Bluford became the first of these three to travel beyond Earth’s atmosphere**.** He went on to fly four more missions. ADVERTISEMENT But the first Black person to travel to space wasn’t Bluford. A Cuban of African descent had done that aboard a Russian Soyuz spacecraft three years earlier. Arnaldo Tamayo Méndez was part of the Intercosmos program. He flew to Salyut 6 in 1980, where he and his fellow cosmonaut conducted experiments on the causes of space sickness and also on sucrose crystallization in low gravity in hopes of improving Cuba’s sugar industry. From that more inclusive NASA astronaut class of the late 1970s, McNair flew aboard the shuttle twice. He died on his second flight, on January 28, 1986, when the space shuttle Challenger broke apart as the nation watched on television. Gregory watched the tragedy unfold from Mission Control, for he was the astronaut on the ground keeping track of the weather that morning. McNair left an amazing legacy in a scholarship program that helps prepare first-generation and traditionally underrepresented undergraduate students for doctoral study. In 1989, Gregory, a pilot, became the first African-American to command a spaceflight. That was his second of three missions. The increasing inclusivity of NASA’s astronaut corps, in fact, has made it an eclectic, incredibly agile group that adapted to the changing role of the space shuttle and continues to adapt to Soyuz missions and planned exploration to Mars. newsletter promo Sign up for Scientific American’s free newsletters. Sign Up The first African-American woman to travel to space was not Epps or even Wilson but, rather, Mae Jemison. Jemison, a physician, served in the Peace Corps before she joined the astronaut corps in 1987. She applied to be an astronaut after she saw Sally Ride become the first American woman in space. Jemison names Nichelle Nichols, who played Uhura on Star Trek, as her role model, for Uhura was the African-American woman spacefarer with whom many of us grew up. During that flight, she honored Uhura by starting each of her work shifts by saying, “Hailing frequencies open.” The 25th anniversary of Jemison’s flight aboard Endeavour occurs this year. **Several African-American astronauts have visited the space station**. Robert Curbeam was the first, in 2001, and Alvin Drew was the last to fly there aboard shuttle, on Discovery’s last mission in 2011. During that flight, he performed a spacewalk. Though he was the two-hundredth person to do that, he wasn’t the first African-American. That first belongs to Bernard Harris Jr., who walked in space back in 1995. Curbeam, in fact, made seven spacewalks over his NASA career, the most of any African-American. ADVERTISEMENT All of NASA, in fact, was headed up by an African-American astronaut. Charlie Bolden traveled to space four times before becoming NASA Administrator in 2009 and serving through the end of President Obama’s administration. The International Space Station has been continuously inhabited for more than sixteen years. Currently, six astronauts are circling overhead, onboard ISS as members of the Expedition 50 crew. Their earthly homes are Russia (three), the United States (two), and France (one), making this very much an international space station. Those of us on the planet’s surface can check to see what the crew has planned for every day they are on station. We can also see ISS traverse the night sky with your own eyes, with instructions from NASA’s Spot The Station website. **To mistakenly think that Jeanette Epps would be the first African-American to visit the station shows a lack of understanding of the long-standing contributions of African-Americans to our nation’s achievements.** To understand that Epps will be the first African-American to be part of an Expedition crew is to celebrate her achievement as part of the rich, ongoing history of this country in the largest sense and of spacefaring and ISS in particular. Her planned mission signals that firsts still remain to be achieved and that there’s no reason to think that a crew to Mars shouldn’t be inclusive and stronger for it. So, mark your calendar for May 2018, when Epps will be onboard ISS, zooming across the heavens inside that spark of light.

# **You Can Do More K (EF K)**

## Framework

#### [ROJ & Giroux] CORPORATIONS ARE TAKING OVER EDUCATION – we desperately need critical pedagogy to resist that.

**Giroux:** Giroux, Henry A. [Waterbury Chair Professor, Pennsylvania State University] “Radical Politics in the Age of American Authoritarianism: Connecting the Dots.” *Truthout*,April 2016. https://truthout.org/articles/radical-politics-in-the-age-of-american-authoritarianism-connecting-the-dots/ CH

At the root of this notion of developing a comprehensive view of politics is the need for educating ourselves by developing a critical formative culture along with corresponding institutions that promote a form of permanent criticism against all elements of oppression and unaccountable power.**One important task of emancipation is to fight the dominant culture industry by developing alternative public spheres and education**al institutions **capable of nourishing critical thought and** action. The time has come for educators, artists, workers, young people and others to push forward **a** new **form of politics** in which public values, trust and compassion trump neoliberalism's celebration of self- interest, the ruthless accumulation of capital, the survival-of-the-fittest ethos and the financialization and market-driven corruption of the political system. Political responsibility is more than a challenge -- it is the projection of a possibility in which new modes of identification and agents must be enabled that can sustain new political organizations and transnational anti-capitalist movements. Democracy must be written back into the script of everyday life, and doing so demands overcoming the current crisis of memory, agency and politics by collectively struggling for a new form of politics in which matters of justice, equity and inclusion define what is possible. Such struggles demand an increasingly broad-based commitment to a new kind of activism. As Robin D. G. Kelley has recently noted there is a need for more pedagogical, cultural and social spaces that allow us to think and act together, to take risks and **to get to the roots of the conditions that are submerging the United States into a new form of authoritarianism wrapped in the flag, the dollar sign and the cross.** Kelley is right in calling for a politics that places justice at its core, one that takes seriously what it means to be an individual and social agent while engaging in collective struggles. We don't need tepid calls for repairing the system; instead, we need to invent a new system from the ashes of one that is terminally broken. We don't need calls for moral uplift or personal responsibility. We need calls for economic, political, gender and racial justice. Such a politics must be rooted in particular demands, be open to direct action and take seriously strategies designed to both educate a wider public and mobilize them to seize power. The left needs a new political conversation that encompasses memories of freedom and resistance. Such a dialogue would build on the militancy of the labor strikes of the 1930s, the civil rights movements of the 1950s and the struggle for participatory democracy by the New Left in the 1960s. At the same time, there is a need to reclaim the radical imagination and to infuse it with a spirited battle for an independent politics that regards a radical democracy as part of a never-ending struggle. **None of this can happen unless progressives understand education as a political and moral practice crucial to creating new forms of agency, mobilizing a desire for change and providing a language** that underwrites the capacity to think, speak and act so as to challenge the sexist, racist, economic and political grammars of suffering produced by the new authoritarianism. The left needs a language of critique that enables people to ask questions that appear unspeakable within the existing vocabularies of oppression. We also need a language of hope that is firmly aware of the ideological and structural obstacles that are undermining democracy. We need a language that reframes our activist politics as a creative act that responds to the promises and possibilities of a radical democracy. Movements require time to mature and come into fruition. They necessitate educated agents able to connect structural conditions of oppression to the oppressive cultural apparatuses that legitimate, persuade, and shape individual and collective attitudes in the service of oppressive ideas and values. Under such conditions, radical ideas can be connected to action once diverse groups recognize the need to take control of the political, economic and cultural conditions that shape their worldviews, exploit their labor, control their communities, appropriate their resources, and undermine their dignity and lives. Raising consciousness alone will not change authoritarian societies, but it does provide the foundation for making oppression visible and for developing from below what Étienne Balibar calls "practices of resistance and solidarity." We need not only a radical critique of capitalism, racism and other forms of oppression, but also a critical formative culture and cultural politics that inspire, energize and provide elements of a transformative radical education in the service of a broad-based democratic liberation movement.

Thus, **the Role of the Judge is to Promote Critical Thinking**, which means helping students develop the skills to question the squo.

#### [ROB & Kellner] AND that requires rejecting the one-dimensional thought that underlies capitalistic culture.

**Kellner:** Kellner, Douglas. [George Kneller Chair in the Philosophy of Education in the Graduate School of Education and Information Studies at the University of California, Los Angeles]. “One-Dimensional Man: Introduction to the Second Edition.” Beacon Press,1964. https://tinyurl.com/2tpwevjk EM/CH

Thus, I would propose interpreting “one-dimensional” as conforming to existing thought and behavior and lacking a critical dimension and a dimension of potentialities that transcend the existing society. In Marcuse's usage the adjective **“one-dimensional” describes practices that conform to pre-existing structures, norms, and behavior, in contrast to multidimensional discourse, which focuses on possibilities that transcend the established state of** affairs. This epistemological distinction presupposes antagonism between subject and object so that the subject is free to perceive possibilities in the world that do not yet exist but which can be realized. In the one**-dimensional society, the subject is assimilated into the object and follows the dictates of external, objective norms and structures, thus losing the ability to discover more liberating possibilities and to engage in transformative practice to realize them.** Marcuse's theory presupposes the existence of a human subject with freedom, creativity, and self-determination who stands in opposition to an object-world, perceived as substance, which contains possibilities to be realized and secondary qualities like values, aesthetic traits, and aspirations, which can be cultivated to enhance human life.

He adds:

In his early works, Marcuse himself attempted to synthesize Heidegger's phenomenological existentialism with Marxism, and in One-Dimensional Man one recognizes Husserl and Heideggerian motifs in Marcuse's critiques of scientific civilization and modes of thought. In particular, Marcuse develops a conception of a technological world, similar in some respects to that developed by Heidegger, and, like Husserl and Heidegger, sees technological rationality colonizing everyday life, robbing individuals of freedom and individuality by imposing techno- logical imperatives, rules, and structures upon their thought and behavior. Marcuse thought that **dialectical philosophy could promote critical thinking.** One-Dimensional Man is perhaps Marcuse's most sustained attempt to present and develop the categories of the dialectical philosophy developed by Hegel and Marx. For Marcuse, **dialectical thinking involved the ability to abstract one's perception and thought from existing forms in order to form more general concepts.** This conception helps explain the difficulty of One-Dimensional Man and the demands that it imposes upon its reader. For Marcuse abstracts from the complexity and multiplicity of the existing society its fundamental tendencies and constituents, as well as those categories which constitute for him the forms of critical thinking. **This demands that the reader also abstract from existing ways of looking at society and modes of thinking and attempt to perceive and think in a new way. Uncritical thinking derives its beliefs, norms, and values from existing thought and social practices, while critical thought seeks alternative modes of thought and behavior from which it creates a standpoint of critique. Such a critical standpoint requires developing what Marcuse calls “negative thinking,” which “negates” existing forms of thought and reality from the perspective of higher possibilities.** This practice presupposes the ability to make a distinction between existence and essence, fact and potentiality, and appearance and reality. Mere existence would be negated in favor of realizing higher potentialities while norms discovered by reason would be used to criticize and overcome lower forms of thought and social organization. Thus grasping potentialities for freedom and happiness would make possible the negation of conditions that inhibited individuals' full development and realization. In other words, perceiving the possibility of self-determination and constructing one's own needs and values could enable individuals to break with the existing world of thought and behavior. Philosophy was thus to supply the norms for social criticism and the ideal of liberation which would guide social change and individual self- transformation.

Thus, **the Role of the Ballot is to Endorse the Rejection of One-Dimensional Thought.** This means distancing ourselves from essentializing modes of thinking – e.g., the notion that value can only come from money. We measure the standard based on whether we remain open to multiple ways of knowing or approaching problems; the more restrictive the approach, the less we adhere to the framework.

## A. Links

1. The AFF frames private entities as for profit corps which means any other form of private entity can’t be considered.

2. The AFF frames the process of appropriation as one that is always about cultural genocide in the interest of money

They are saying that the actors who count as private entities are Elon musk and jeff Bezos and that they are the only ones

## B. Impacts

#### [Morris] DISIMAGINATION – the aff assumes private companies can only use outer space in ONE WAY, but private non-profits are working to benefit the public, like people with disabilities.

**Morris:** Morris, Amanda. [Amanda Morris is a 2021-2022 disability reporting fellow for the National desk] “A Future for People With Disabilities in Outer Space Takes Flight” *New York Times,* 2021. JP

**Eric Ingram typically moves through the world on his wheelchair**. The 31-year-old chief executive of SCOUT Inc., a smart satellite components company, was born with Freeman-Sheldon Syndrome, a rare condition that affects his joints and blocked him from his dream of becoming an astronaut. He applied and was rejected, twice. But onboard a special airplane flight this week, he spun effortlessly through the air, touching nothing. **Moving around, he found, was easier in the simulated zero-gravity environment where he needed so few tools to help**. While simulating lunar gravity on the flight — which is about one-sixth of Earth’s — he discovered something even more surprising: for the first time in his life, he could stand up. “It was legitimately weird,” he said. “Just the act of standing was probably almost as alien to me as floating in zero gravity.” He was one of 12 disabled passengers who swam through the air aboard a parabolic flight in Southern California last Sunday in an experiment testing how people with disabilities fare in a zero-gravity environment. Parabolic flights, which fly within Earth’s atmosphere in alternating upward and downward arcs, allow passengers to experience zero gravity for repeated short bursts, and are a regular part of training for astronauts. **The flight was organized by AstroAccess, a nonprofit initiative that aims to make spaceflight accessible to** to all. Although about 600 people have been to space since the beginning of human spaceflight in the 1960s, NASA and other space agencies have long restricted the job of astronaut to a minuscule slice of humanity. The American agency initially only selected white, physically fit men to be astronauts and even when the agency broadened its criteria, it still only chose people that met certain physical requirements. This blocked the path to space for many with disabilities, overlooking arguments that disabled people could make excellent astronauts in some cases. But the **rise of private spaceflight, funded by billionaires with the support of government space agencies, is creating the possibility of allowing a much wider and more diverse pool of people to make trips to the edge of space and beyond.** And those with disabilities are aiming to be included. The participants in Sunday’s AstroAccess flight argue that accessibility issues must be considered now — at the advent of private space travel — rather than later, because retrofitting equipment to be accessible would take more time and money. The Federal Aviation Administration is prohibited from creating safety regulations for private spaceflights until October 2023. Initiatives like AstroAccess are aiming to guide the way that government agencies think about accessibility on spaceflights. “It’s crucial that we’re able to get out ahead of that regulatory process and prevent misinformation or lack of information or lack of data from making bad regulation that would prevent someone with disability flying on one of these trips,” Mr. Ingram said. **The group also hopes that making everything accessible from the get-go could lead to new space innovations that are helpful for everyone, regardless of disability.**

#### [Arendt] ASSUMING PRIVATE ENTITIES CAN ONLY BE BIG CORPORATIONS IS THE ESSENCE OF ONE-DIMENSIONAL THOUGHT – the notion that they can only be used one way utilitarianizes the world and equates “private” with “for-profit.” This makes it impossible to find meaning in *anything*: if everything’s a means, nothing can be an end.

Arendt: Arendt, Hannah. [Political philosopher] *The Human Condition*, 2nd edition. Chicago: University of Chicago Press, 1958, reprinted 1998. <https://monoskop.org/images/e/e2/Arendt_Hannah_The_Human_Condition_2nd_1998.pdf> CH

The implements and tools of homo faber, from which the most fundamental experience of instrumentality arises, determine all work and fabrication. Here it is indeed true that the end justifies the means; it does more, it produces and organizes them. The end justifies the violence done to nature to win the material, as the wood justifies killing the tree and the table justifies destroying the wood. Because of the end product, tools are designed and implements invented, and the same end product organizes the work process itself, decides about the needed specialists, the measure of co-operation, the number of assistants, etc. During the work process, everything is judged in terms of suitability and usefulness for the desired end, and for nothing else. The same standards of means and end apply to the product itself. Though it is an end with respect to the means by which it was produced and is the end of the fabrication process, it never becomes, so to speak, an end in itself, at least not as long as it remains an object for use. The chair which is the end of carpentering can show its usefulness only by again becoming a means, either as a thing whose durability permits its use as a means for comfortable living or as a means of exchange. The trouble with the utility standard inherent in the very activity of fabrication is that the relationship between means and end on which it relies is very much like a chain whose every end can serve again as a means in some other context. In other words, in a strictly utilitarian world, all ends are bound to be of short duration and to be transformed into means for some further ends.19 This perplexity, inherent in all consistent utilitarianism, the philosophy of homo faber par excellence, can be diagnosed theoretically as an innate incapacity to understand the distinction between utility and meaningfulness, which we express linguistically by distinguishing between "in order to" and "for the sake of." Thus the ideal of usefulness permeating a society of craftsmen-— like the ideal of comfort in a society of laborers or the ideal of acquisition ruling commercial societies—is actually no longer a matter of utility but of meaning. It is "for the sake of" usefulness in general that homo faber judges and does everything in terms of "in order to." The ideal of usefulness itself, like the ideals of other societies, can no longer be conceived as something needed in order to have something else; it simply defies questioning about its own use. Obviously there is no answer to the question which Lessing once put to the utilitarian philosophers of his time: "And what is the use of use?" The perplexity of utilitarianism is that it gets caught in the unending chain of means and ends without ever arriving at some principle which could justify the category of means and end, that is, of utility itself. The ‘in order to’ has become the content of the ‘for the sake of’; in other words, utility established as meaning generates meaninglessness. Within the category of means and end, and among the experiences of instrumentality which rules over the whole world of use objects and utility, there is no way to end the chain of means and ends and prevent all ends from eventually being used again as means, except to declare that one thing or another is "an end in itself."

## C. Alternative

#### [Jones 2] Thus, the alternative is to reject the aff and replace their representations with Ethnofuturism, abbreviated “EF,” a method that emphasizes critical thinking by confronting colonialist capitalism.

**Jones 2:** Jones, Craig Henry. [Writer at Society and Space] “Enclosing the Cosmos: Privatising Outer Space and Voices of Resistance” *Society and Space,* 2021. https://www.societyandspace.org/articles/enclosing-the-cosmos-privatising-outer-space-and-voices-of-resistance CH

These manoeuvres to privatise Outer Space rely not only on the enclosure of physical and legislative places but also seek to enclose imaginative spaces through the process(es) of disimagination. Broadly conceived, disimagination is a process that curtails our ability to think critically and imagine new futures through cultural apparatuses and public pedagogies designed to erase the multiplicity of historical realities that deviate from the hegemonic ‘norm’ (Didi-Huberman, 2008: Giroux, 2014). Whilst this concept has been used in Didi-Huberman’s discussion of the destruction of concentration camp materials and Giroux’s work on critical pedagogy and civic rights, the process of disimagination is operating within and upon discourses of Outer Space, as I discuss later in this piece. These attempts at disimagination are not going unchallenged, however, with Ethnofuturist works disrupting the oftentimes de facto futures of Outer Space and asteroid mining. Ethnofuturism critically responds to the disimagination process as it combines the Ethno- (the archaic, indigenous, or cultural histories of peoples) and -futurism (deemed the cosmopolitan, urban, and technological) (Hennoste, 2012). Consequently, Ethnofuturism can be construed as a process by and through which histories that deviate from the hegemonic ‘norm’ are reinvigorated and mobilised to (re)produce alternative discourses of futurity. Ethnofuturism here is used as an umbrella term that contains within it futurisms from a variety of groups and people. Examples of such futurisms include, but are not limited to: Afrofuturism, Aotearoa futurism, Cambrofuturism, and Sinofuturism. The following discusses enclosure, disimagination, and Ethnofuturism to problematise these futures of asteroid mining: highlighting how popular NSE discourses draw upon a Eurocentric rendition of a ‘Grand Historical Narrative’. Through this, we may begin to challenge the totalising concept of ‘humanity’ [4] oft-invoked by asteroid mining advocates and turn a more critical lens to these purported futures and the discourses (re)created to justify them.

### DA

#### [Duren] DA to the aff, you prevent non-profits like carbon mapper from stopping climate change.

**Duren:** Duren, Riley. [Research Scientist at the University of Arizona and an Engineering Fellow at NASA’s Jet Propulsion Laboratory.] "In Partnership with UArizona, New Nonprofit to Launch Satellite Program to Track Greenhouse Gas Emissions" *UArizona.* April 15, 2021. TB

**In a first-of-its-kind coalition to accelerate climate change action**, and with help from UArizona researchers, **a** new **nonprofit organization called Carbon Mapper is launching a program to improve scientific understanding of global methane and carbon dioxide emissions**. Carbon Mapper, a new nonprofit organization partnering with the University of Arizona, today announced a groundbreaking program **to help improve understanding of and accelerate reductions in global methane and carbon dioxide emissions.** The **Carbon Mapper** consortium also **announced plans to deploy a satellite constellation to pinpoint, quantify and track methane and carbon dioxide emissions.** "This decade represents an all-hands-on-deck moment for humanity **to make critical progress in addressing climate change**," said Riley Duren, research scientist in the UArizona Office of Research, Innovation and Impact and CEO of Carbon Mapper. "**Our mission is to** help **fill gaps in the emerging global ecosystem of methane and CO2 monitoring systems by delivering data that's timely, actionable and accessible for science-based decision making**." **Current approaches to measuring** methane and carbon dioxide **emissions** at the scale of individual facilities – particularly intermittent activity – **present challenges, especially in terms of transparency, accuracy, scalability and cost.** **Carbon Mapper** – which also is **partnering with** the state of California, **NASA**'s Jet Propulsion Laboratory, Planet, Arizona State University, High Tide Foundation and RMI – **will help overcome these technological barriers and enable accelerated action by making publicly available high emitting methane and carbon dioxide sources quickly and persistently visible** at the facility level. The data collected by the Carbon Mapper constellation of satellites will provide more complete, precise and timely measurement of methane and carbon dioxide source level emissions as well as more than 25 other environmental indicators. **Through the** Carbon Mapper-**UArizona partnership**, Duren and other UArizona **researchers offer scientific leadership** of the methane and carbon dioxide emissions data delivery **including developing new algorithms** and analytic frameworks **for testing** them with an ongoing research program. "Time is of the essence when it comes to understanding and mitigating methane and CO2 emissions," said Senior Vice President for Research and Innovation Elizabeth "Betsy" Cantwell. "Partnering with **Carbon Mapper will give** University of Arizona **researchers the tools needed to** not only see emissions hot spots, but to **understand their causes and develop actionable plans** for reducing or eliminating these sources." **Carbon Mapper, in collaboration with its public and private partners, is developing the satellite constellation** in three phases. The initial study phase, now complete, included two years of preliminary engineering development and manufacturing. **The first phase is underway and includes development of the first two satellites** by Planet and JPL, **scheduled for launch in 2023**, accompanying data processing platforms, and ongoing cooperative methane mitigation pilot projects using aircraft in California and other U.S. states. P;’