### Framework

#### The Single Standard is Life Utilitarianism

#### Extinction outweighs – trying to improve the lives of people while ignoring existential threats fails to uphold any value to life – the only universal ethic is to avoid human extinction

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This article’s main thesis1 is that, given the existence of at least two global threats, nuclear weapons and climate change, which endanger the life of humankind as a civ- ilized species, its right to survive should be asserted as its **first** human or rather **fundamental right**. The sense of this assertion is not just philosophical but legal as well.¶ To substantiate this thesis, I shall go through six argumentative steps:¶ 1. Why begin with global threats.¶ 2. Why survival is the leading category in this field, and¶ how it interplays with justice.¶ 3. What interest humankind has in its survival, and why¶ it should be protected as a right.¶ 4. Why regard “humankind” rather than “all indi-¶ viduals” as a possible actor.¶ 5. Why speak of a fundamental rather than human¶ right, and how to constitutionalize this right.¶ 6. How two developments in international law after 1945 can contribute to support the argument I have¶ been sketching.¶ \*\*¶ 1. If philosophical thinking starts with being amazed at something in the world (Plato’s θαυμα ́ζειν), my in- terest in the present matter2 was first stimulated by the pre-philosophical amazement I always felt in seeing that in the now enormous human rights discourse (both in politics and academia) so much care is dedicated to the single individuals, and so wide-ranging designs of a cos- mopolis to come are based on their rights. Yet **nobody seems to take note** that the life of all present and future individuals could be annihilated by a nuclear war or up- set by catastrophic developments of climate change. It is like insisting on first debating the rights of a ship’s third- class passengers 3 instead of taking action in the light of the fact that the ship is already taking in seawater from a leak (climate change is already happening) and also risks to hit a mine that is floating around and would send it along with all passengers and crew straight to the ocean depths (by thinking and acting timely, leaks can be filled, mines detected and swept away, all ac- tions that would put the care for third-class passengers¶ on a firmer ground). These dangers are philosophically significant because they tell something about human beings, the only ones who have become able to destroy their own race, as well as about modernity: the possibil- ity of self-destruction sets an end to this era, opens a new one, which can only vaguely be termed post-modern,4 and requires an updated rewriting of the Dialectics of the Enlightenment. It is also politically significant as it challenges present politics to restructure itself by ex- tending its attention to the far future, something which is not possible within the boundaries of modern politics because of its narrow time structure.5 In a more precise language, I term challenges like nuclear weapons (con- sidered in themselves, while nuclear proliferation is but a subphenomenon) and climate change global (in a very specific sense) because they are lethal and planet-wide, can hit approximately everybody on earth and can be reasonably addressed only by the near totality of coun- tries and peoples. They would not wipe out biologically humankind, although this cannot be excluded in case of an all-out nuclear war; but they would destroy human civilization:6 not a set of values, but the set of material and cultural tools (agriculture, communications, trans- portation and trade) that allow unspecialized animals like the humans to survive and to thrive.¶ It is clear that my thesis presupposes a revised scale of relevance among the issues requiring and stimulat- ing theoretical investigations: in my philosophical view global threats have a greater relevance and are intellec- tually more challenging than the issues suggested by the media’s headlines (present wars, terrorism, group and minority rights in the US, multiculturalism in Canada or Australia, immigrants in Europe, or, more recently, the crisis of the global economic system). As a reflection upon the deeper longue dure ́e determinants of human- ity’s fate, political philosophy should not necessarily espouse the agenda suggested by current politics and journalism and, instead, seek its own independent as- sessment of the state of the world as part of its business; this is a critical attitude that cannot be implemented without a philosophical view on history (not to be con- fused with a revival of the “grand narratives”). Besides, the shifting of most of Critical Theory to pure normativity has favored the emergence not just of worldviews based on the predominance of Sollen, but also of an exclusive attention on intersubjectivity and its troubles; as if challenges to politics and civilization caused by systemic imperatives (such as the nuclear threat and¶ climate change) were beyond the grasp of critical inquiry. What I am attempting in this article is to address an issue such as human rights that is typical of the self- centered normative approach mentioned and to show how it should be restructured to address the challenges for humankind’s survival.¶ In this attempt I am driven by the intent to debunk the layer of denial (or repression in pshychoanalyti- cal sense) that, more intensely after the end of the Cold War, has removed the nuclear threat from the philosoph- ical reflection on modernity and has later prevented cli- mate change from entering the main agenda of Critical Theory. There is also an epistemological aspect in this: a critical Zeitdiagnose, or an informed assessment of where history has taken us to in our post-modern times is not possible without first taking what hard science has to say about the threats for humankind very seriously.7 With rare exceptions, critical theorists seem to be reluctant to address the philosophical issues raised by global challenges, not to mention their complete denial beginning with Horkheimer and Adorno in the Fifties and Sixties (when Mutual Assured Destruction became a real possibility) of the meaning of nuclear weapons. It is as if Critical Theory, despite its claim to be a gen- eral assessment of our civilization, had accepted a tacit division of labor in which its competence is restricted to social justice (in continuation of its original being rooted in the Marxian critique of political economy) and the “damaged”8 subjectivity. The rest of the real world is left to a purely Hobbesian (and later Luhmannian) reading, or to the perception of side-figures such as Karl Jaspers or Gu ̈nther Anders.¶ A last epistemological remark: starting from problems and threats that, however socially generated, come up as physical events and are accounted for by hard science has the advantage that philosophy can work on them without first engaging in a complicate and doubt- ful theorizing about how the world should be reshaped according to a general normative theory. This ad hoc theorizing shows the ability or inability of a philosoph- ical view to come to terms with problems that are of paramount importance to everybody, not just to the prac- titioners of Schulphilosophie.¶ 2. I have explained elsewhere9why survival rather than justice is the leading category of a philosophy of global threats. The now thriving literature on justice and climate change misses the point that before we look for ways to establish justice between generations, we have to motivate our interest in their **existence** and wellbeing, or rather in the existence and wellbeing of humankind.10 While survival of humankind is what best defines our problematic situation, when it comes to the normative aspect I believe that we should assume responsibility for future generations rather than do justice to them; talking responsibility I move from its most elementary¶ manifestation, the responsibility parents take on for their children. Justice as fairness comes in when we have to fight back “generational nepotism:” it is wrong for any generation to spoil the environment without regard to the consequences in the future, far that it may be, that is not just out of respect for those that may harm our children and children’s children. Out of elementary fairness, as expressed in the Golden Rule, we cannot deny parents of the, say, twenty-fifth century the chance to bear and educate their children in decent conditions.¶ Now, survival is a Hobbesian category, as such it sounds like an anathema to critical thinking, just as most categories stemming from the tradition of politi- cal realism do. Since under global threats present and future humankind is really endangered in its survival, it is however hard to see the rationale of denying the fact because the name comes from the enemy’s vocabu- lary. More importantly, there is an essential difference: Hobbes’ survival regards the individual and is there- fore self-centered and adversarial (in common parlance, mors tua vita mea), while humankind’s survival as a moral and political goal is by its own definition an uni- versalistic feature. More on this later.¶ A much talked-about issue in this context is the so- called identity problem, which I am however inclined to dismiss. If it means the doubtfulness of any engagement in favor of future generations because we do not know if they will exist (we could decide to stop procreating), the problem is surrounded by an air of futility: there is no imaginable decision process that could effectively lead to a total procreation stop. On the other hand, if only a few humans were alive in the far future, this would be enough of a reason for our engagement. Of course future humanity could never be born because meanwhile the planet may have been burnt out by an asteroid (natural precariousness of human life) or an all-out nuclear war (man-made precariousness). Neither type of precarious- ness can however be a reason not to endorse the interest of future generations in survival, because reducing that precariousness is exactly the engagement’s telos. The other aspect of the identity problem — the non-identity of posterity’s values and preferences with our own, or their indeterminacy — is not relevant to our case, be- cause the goal for whose attainment we are called to save or sacrifice something for their survival has to do with their sheer survival (in an indispensably civilized framework, as explained above) rather than with our own and the posterity’s moral configuration; in other words, there is no paternalistic attitude in it.¶ In a fairly different meaning, closer to social rather than moral (analytical) theory, identity comes up in an- other sense. Assuming responsibility for (or, for that matter, being fair to) future generations is not just an altruistic attitude. Not in the sense that we can do as well do so by acting on egoistic grounds: were this the¶ main reason to take action, we were justified to limit our effort to the less costly adaptation policies instead of funding the restructuring of the economy necessary for mitigation, the only way-out from global warming for generations of the far future. To be true, addressing the limitation of global warming or the neutralization of nuclear weapons requires wide-ranging undertakings that can be justified only on grounds of a moral attitude towards future generations rather than of our enlight- ened self-interest. But doing what we can for the survival of humankind can give ourselves reassurance that our individual life (also seen in the context of our gen- eration’s) is meaningful beyond the limits of our own existence on earth, because doing so helps us shed our isolation as single individuals or single generation and become partners in a wider transgenerational covenant of solidarity.¶ 3. That the interest to live and to raise children in de- cent conditions we attribute to future generations ought to be translated into a right is not self-evident. It is not simply that we should abstain from transforming every reasonable claim into a right, and instead reserve this category for the essentials that make the associated life of individuals in the polity possible and acceptable ac- cording to each evolutionary stage.11 More importantly, doubts may also arise as to whether it is wise to translate any goal of social and political struggles into a right, that is to “juridify” it instead of focusing on the underlying conflict dynamics and the participation of the conflict- ing parties. In general I share this preoccupation, and have misgivings at any inflationary expansion of the hu- man rights catalogue. On the other hand, moral rights that do not translate into legal rights12 are politically pointless or at least much less significant than the rights enshrined in a legal order. Also, our case is different, and the issues we are confronted with are more radi- cal than the worries with ‘juridification;’ this is all the truer, since the establishment of a right to survival for humankind would require a long and fierce political and intellectual battle in the first place.¶ First of all, does the right of humanity to survival qualify as a (basic or human) right? Before we proceed, let us note that humankind’s survival is not a good like civil liberties, which is completely at the disposal of human beings; instead, it can depend on the orbits of asteroids and other NEOs.13 The “right of humankind to survival” should therefore be read as a short for “the right of humankind, including future people, to have all previous generations doing their best to ensure their sur- vival and protect them from man-made threats.” In this version, we are clearly afar from the confusion between rights and goals criticized by Dworkin14 (§3.1 in the chapter on Difficult cases), the causation of the good at stake (survival) being elusive, or not completely nor (in the case of climate change) undoubtedly human; also¶ the content of the right is not a physical state, but rather the behavior influencing it. In a manifest way, this also identifies the right’s indispensable correlate, that is the duty of the relevant actors (individuals and institutions) to refrain from behaviors that are likely to cause harm to that good.¶ Whether or not this claim can translate into a right should be investigated from two points of view, those of its structure (a) and its bearer (b).¶ a. As for structure, three of Feinberg’s15 four crite- ria for being a right are already met (to have a content, a holder and an addressee). The fourth, the ‘source of validation,’ gradually emerges from the argument I am unfolding. Frydman and Haarscher also list four condi- tions, of which three are already present (titulaire, objet, opposabilite ́) – even if more remains to be said about the first one; while the fourth condition (sanction) shall be discussed below in the framework of the constitu- tionalization problem.16 Finally, let us look at the stan- dard distinction of negative and positive rights, which Shue rightly believes to be substantially untenable. This is also true in our case, because the ‘behavior’ of in- dividuals and institutions, which humanity is entitled to expect, according to the new right, can be imple- mented either by abstaining in single cases from using or possessing nuclear weapons and emitting excessive GHGs or by establishing new institutions (a global En- vironmental Protection Agency, say) and strategies (for example, technology transfer from advanced to develop- ing countries to help the latter rein in global warming). What would be acknowledged would be the right, not the policies that according to time and circumstances are devised for its realization.¶ Does this new right share with the other fundamental or human rights the need to be founded in a conception of the human, such as those focused by Donnelly on dignity, by Meyers on moral agency and by Frydman and Haarscher on autonomy?17 Not properly, or not di- rectly. Humanity’s right to survival is a meta-right rather than being the first right and sharing the same founda- tion with the others.18 Therefore, its foundation is for- mal rather than rooted in a substantive view of what is human: acknowledging this right is the pre-condition for making all other rights possible. It is their Bedingung der Mo ̈glichkeit, to put it as Kant might have done. Not only in the trivial but sturdy physical sense that human rights can only apply to a living humankind, but not to a ”republic of insects and grass” (Jonathan Schell on the state of the earth after a large nuclear war19). The meta-right as a pre-condition has rather to be un- derstood in the moral sense: no foundation of morality or legality (except in a totally positivistic view of the latter) makes sense if it cannot rely on the respect of the fundamental rights of those (poor populations al- ready affected by global warming, future generations¶ as victims of nuclear war or extreme climate change) harmed by our acts and omissions. Here I mean moral- ity at large, regardless of its being based on a conception of the right or the good. In other words, the two global challenges, which have received so little attention in the mainstream philosophy of the last decades, have indeed philosophical implications capable of undermining the business-as-usual attitude in moral and political theory; I mean the attitude to think of the foundations of moral- ity and polity as if the man-made (modern) world in which they operate had not been substantially altered by humankind’s newly achieved capability to destroy itself and/or the planet.¶ Let us make a further step on the road that leads to uncouple, as far as it goes, the foundation of a new right of paramount importance from a substantive conception of the human – an effort aimed at protecting it from the uncertain or frail fate of such conceptions. On the one hand, as a meta-right to individual-only human rights, the right to survival does not imply a choice among substantive values; this right does not refer to a partic- ular conception of what is good for future generations, as it only wants to ensure for them existential condi- tions that are an indispensable basis for their members to pursue whatever idea of the good, of liberty and self- realization they may choose. On the other hand, survival is indeed referred not to the mere biological fact, but to the survival of humankind in decent, civilized condi- tions, taking civilization in the meaning explained in §1. Alone, as I explained above, this qualification is not an added axiological component (civilization as a sys- tem of values), as it rather relies on the analytical view that some technical and cultural features of civilization are essential to the life of the human species.¶ There is a last aspect to be examined with regard to the structure or nature of this right: its emergence not from a shift in the doctrine of human rights, but as a response to a new situation in world history, in which survival goods (a livable atmosphere in the first place) that were so far tacitly taken for granted turn out to be no longer guaranteed, but more and more endangered. As such, this new right reconnects to what we know about individual human rights, that is that they come up as a response to “perceived threats” and build an “evolving whole”.20¶ b. Let us now come to the question of the right’s bearer. It is humankind, defined as the generality of the living individuals along with those who will be born. There are three possible objections to this proposition.¶ First, it seems to be self-evident that the notion of a human right for the so defined humankind cannot be subject to the classical liberal objection that bearers of such rights are individuals, not groups.21 Humankind is not an exclusive and self-contained group opposed to others (at least until we do not have our first contact with¶ dwellers of other regions of the universe), nor is it meant here to represent particular sets of values. Between the two meanings of “humanity” — as species (Artbegriff) and as regulative notion of a community cemented by shared values and goals (Zielbegriff)22 — I am referring to the first one; it is now becoming philosophically sig- nificant because not even its biological existence can be taken for granted under man-made threats. Humankind is not a hypostasis detached from the individuals, as in the case of ‘the community’ or ‘das Volk,’ as it rather means the totality of the living individuals of any given generation including (a) their potential to generate fur- ther human beings and generations and (b) their knowl- edge that the latter will exist and probably suffer. This reflexive notion of humankind raises a problem, but remains open to different ethical choices: indifference towards future generations, responsibility for them, and obligations assumed in their favor.¶ 4. A second question is: why should we speak of humankind instead of limiting ourselves to the more sober expression “all present and future individuals?” There is first a lexicological advantage, in as much as we thus use one word instead of connecting two by an “and.” This better conveys the sense that the bond of solidarity based on the responsibility for the elementary living conditions of posterity makes present and future individuals one community – in this sole, thin sense in- deed, which does not try to conceal the deep fractures existing between contemporaries within the present and the successive generations of this community. The very inclusion of future people into humankind is not an act of inclusive kindness towards them, but is rather made compelling by the lethal threats that past and present people have projected into the life of posterity, in an amount unprecedented in history. Lastly, introducing humankind as a bearer of rights highlights that the right of the individuals to be alive and free can be enjoyed only in the middle of a larger community, which makes the claim of human rights possible and helps to im- plement them. In times of economic globalization and global threats, we have come to know that this com- munity is the whole humankind, not just nations. All this however does not alter the truth that who is entitled to vindicate the right to survival is not humanity as a hypostasis, but every individual either living or not yet born – very much like what happens with individual human rights, whose constitutional formulation makes them enjoyable for every citizen who will in the future be born under the same Constitution.¶ Third comes the standard objection: it does not make sense to endorse obligation towards future people, since, if men and women agree to stop reproduction, those people might never be born. I have already dismissed this as a futile mental experiment. It could further be argued, though, that future generations might turn out¶ to have moral standards totally different from ours. Yet, the possibility that posterity will be not amenable to our moral world is not huge enough to release us from any responsibility towards them. We can still under- stand, and to an extent share, the moral problems raised by the Bible or the Greek classical tragedy of millen- nia ago and should not easily assume that our fellow humans of the year 3000, dwellers of a planet spoiled by global warming, will be morally so hugely different from us.¶ Finally, let me anticipate here one of the legal con- siderations that will be developed later on. Any right- establishing text (but I am now referring to the Universal Declaration of Human Rights, UDHR 1948) works with the basic formula “everyone has the right to etc.”23 The validity of the claims is limited only by the spatial ex- tension of the law: a right established by the French Constitution may be thought to be valid universally, but is legally protected only on French territory, while the rights mentioned in the UDHR apply by definition to the entire world where humans live. This can be dubbed spa- tial universalism, while establishing a right of present and future humanity to survive is tantamount to adding a time universalism. In other words, this makes explicit that the right of everyone to a just international order (UDHR 1948, Art. 28; more below) also holds for the ‘everyones’ of the year 3000. This may have always been tacitly intended by the law, the only time limit ly- ing in the possibility that the law is at some point in the future dismissed by another law canceling or expand- ing those rights. In a present like ours, in which it has become known that the future is no longer guaranteed to be essentially homogeneous (with no radical change in the physical and anthropological life conditions) to the present and the past, it has become necessary to openly establish a linkage between our obligations and the rights of future generations, as far as existential issues are concerned; a link that will likewise apply to them as soon as they become the present generation.¶ So far, I have clarified the moral and, to a lesser extent, legal reasons for introducing the notion of hu- mankind as right bearer. I will now stress that the hu- mankind discourse in this article remains political rather than moral.¶ It is not necessary here to rerun the history of the humankind/humanity notion; it is enough to remember that its denial has been a stronghold in the battle of value nihilists (Nietzsche) and realist thinkers (Oswald Spen- gler, who dismissed it as a “zoological notion,” and more extensively Carl Schmitt in Schmitt 1976, particularly §6). As self-contained units (such as the Westphalian system states) were deemed to be the only sustainable and legitimate polities, any reference to humanity was seen as toothless or manipulative, as a noble universalis- tic alibi for particularistic interests.24 Setting aside this¶ sort of criticism, which mistakes the ideological use of the term for its very substance, we know that humanity, as a good-will aspiration of philosophers, poets and re- ligious men, could not be regarded as a political notion because only non-voluntaristic communities can be re- garded as political. They alone allow for binding and effective decisions, whereas any partner can at any time and according to its convenience withdraw from mem- bership in “humanity” or other large associations based on just good will.¶ This can now be expected to change, because planetary lethal threats such as nuclear war or disastrous climate change have the potential strength to forge all relevant political actors into one community, not unlike Hobbes’ individuals, who received the push to unite from the threats to their life and limbs: first because they are all put in danger, and second because they have to act jointly if they really want to fight back those dangers. This is a possibility, not an actual and inevitable process, as there are enough counter-forces that impede those ‘Hobbesian’ threats to fully make hu- mankind one political community: fear, the protecting passion, does no longer work as smoothly as in Hobbes’ model of Leviathan.25 Nor is the potential contained in global challenges supposed to generate a world state as its only outcome: practicing survival policies, who- ever the actors may be, is more important than a uni- fied state-like structure in charge of doing so. Nonethe- less all this is enough to use ‘humankind’ in a political sense, as something that is a potential constituency rather than a fragmented multiplicity of individuals and states.¶ 5. Why a fundamental rather than a human right? The distinction between human and fundamental is not univocally worked out in the literature.26 In the vocab- ulary I am using here, human rights are seen as a philo- sophical concept and a moral (deontological) precept, while fundamental rights are those positively acknowl- edged in a legal order, entrusted to political and institu- tional processes for their implementation, and claimable in courts – this last feature being more problematic. Putting on humankind’s survival the label of a funda- mental right avoids leaving it in a philosophical limbo as a regulative idea,27 and gives it a better defined political and legal nature; this is more adequate to the character- istic of survival as something endangered by political decisions (or the lack thereof) and requesting a political solution by a given deadline (the next few years if we want to try to keep the temperature increase expected by 2100 under two degrees).¶ If humankind’s survival is acknowledged as a funda- mental right, it follows that it should be constitutional- ized, that is inserted in new and old (and aptly modified) Constitutions as well as in a new version of the Univer- sal Declaration of Human Rights; as such, it could be referred to as highest guidance in international treaties aimed at implementing it – rather than being enshrined in a specific ‘survival’ treaty. In constitutional law, a development in this sense is already taking place, in as much as either the rights of future generations to a safe environment or our responsibility towards them in this regard or the imperative to preserve the environ- ment (without mention of the future generations, but implicitly to their benefit) have been affirmed in consti- tutional amendments of the last two decades in countries such as Germany, France, Switzerland, but also Burkina Faso and Burundi. Having rights or being protected by the legally defined responsibility of the previous gener- ations is however not the same thing, and with regard to humankind’s survival I would point at its stronger formulation as a right: it is more binding, while the ob- jections against endowing future generations with rights can be easily argued against. Just because it is conceived in favor of those who cannot yet uphold their interest, this right should be protected against cancellation by a sort of Ewigkeitsklausel as in Art. 79.3 of the German Grundgesetz.28 A right to survival is more specific and more stringent than the right to a safe environment be- cause it derives from lethal and global challenges that affect the very core of the polity, protection, rather than from a generic care for a balanced relationship to na- ture or from a diffuse feeling of benevolence for the posterity.¶ In national or regional Constitutions, the acknowl- edgment of this right could be accompanied by the establishment of corresponding institutions, promoting the implementation of the new right; it could be for example an ombudsman29 for future generation as a (countermajoritarian)30 authority protecting their inter- ests against damages resulting from new legislation, and endowed with the power to send it back to the legislative rather than to veto it straight away.31 Not to be underes- timated are the difficulties that would arise in striking a very delicate balance on two levels: in general between the interests of present and future generations,32 but also between parliaments or executives, which act under the pressure of their constituencies, and the members of the ombudsman authority, who remain nonetheless contem- poraries of the former rather than being appointed by the latter – for all too natural reasons.¶ The same difficulty would affect the national courts in which the new fundamental right, as jus cogens principle, should be made claimable at the initiative of institutions such as the ombudsman or of advocacy groups representing a significative number of citizens in a referendum-like counting procedure. In international courts,33 the interest of future generations should be represented by an ombudsman to be established at the UN as well as at regional associations of states such as the EU or Mercosur. A point however that remains¶ open to further discussion has been raised in the de- bate on socio-economic or solidarity rights, which may have some affinity with the right to survival: theoreti- cally, Frank Michelman has made clear that the status of a norm as constitutional law ought not to be con- flated with the question of its availability for judicial enforcement.34 In practice, conflicts are easily possi- ble between the courts sentencing on the states’ failure to implement those rights and “the vain or overbearing nature of these sentences” on a matter that is political rather than judicial. 35 This is true in our case as well: the attainment of a new international order without national possession of nuclear arms or a carbon-free reordering of the world economy are goals for policy-making, not something that can be attained in courts. In this frame- work, however, courts are not jobless: sentencing the nuclear-armed states for their failure in implementing art.VI of the Nuclear Non-Proliferation Treaty (NPT),36 or the US of the Bush years for withdrawing from the Kyoto Protocol and failing to cut emissions is a typical judicial matter, as the two cases would regard the break of treaty obligations or the failure to cease doing some- thing harmful, not to bring about something good.37¶ Finally, two more fundamental objections could be raised against the idea of a legal protection of the inter- est of future generations. It could be argued that what would be represented (in a time-universalistic mode) is not the interest of future generations, but rather the interest of a particular fraction of the present ones, dis- guising itself as standard bearer of those people to come. On the one hand this should be taken into account as critical point of view in the public debate on those inter- ests. On the other hand, this criticism, strictly speaking, would also delegitimize such an ancient principle of Roman and Western law as the protection of the child. In morality it would affirm a radical skepticism that denies the possibility of slipping into another person’s clothes and acting from a non-egoistic stance. This can be obviously upheld, but at the price of the disappear- ance of morality as well as of the polity, which is – in any case and among other things – a solidaristic association.¶ A second problem, which is more difficult to deal with, is that we do not know as a general piece of knowl- edge what the interest of future generations is; whereas in the case of legal protection of the child we share a generally accepted knowledge of his or her future in- terest (to remain healthy, to get sufficient education, to be free to make the best of him/herself). What the real life conditions and the presumable vital interests of fu- ture generations will be can only be tentatively argued from what the several branches of natural and economic (e.g. demography) science are able to tell us about what is likely to remain constant in physical and cultural anthropology and what is likely to be most endangered.¶ As such, it is important that moral and political theory renew their relationship to the natural sciences after a time of reciprocal disdain between the two. While sci- ence cannot by itself draw an encompassing picture of future life under global threats, philosophy should learn from science what those future problems are likely to be and elaborate on them, instead of reflecting on the future of humanity by just moving from the doctrines of past philosophers or relying on the hearsay about it based on media reports or the philosopher’s personal divinations.¶ 6. My philosophical proposal to fill a hole in human rights discourse and legislation by introducing a first or meta-fundamental right of humankind to survival and positivizing it in national, international and world law38 resonates with two legal developments. The first related to ‘humanity’, the second to ‘human rights.’ The latter resonates with the novelties in constitutional law men- tioned in §5.¶ The first one began in 1970 as the UN General As- sembly adopted Resolution 2749, the Declaration of Principles Governing the Seabed and Ocean Floor, con- taining the notion of a “common heritage of mankind”; it was originally introduced to protect the seabed and ocean floor and later the “moon and other celestial bod- ies” from exploitation by powerful countries against the interest of the developing ones.39 In the 1990s, the competing and “thinner” concept of “common concern of mankind” emerged, as in the Convention on Bio- diversity of 1992; nonetheless it can be said that hu- mankind has become a notion contained in binding in- ternational law and referred to indivisible (climate) and divisible (seabed, ocean floor, moon) objects, and that this has happened as an answer to problems and chances generated by huge technological advancement.¶ In another corner of legal development, it could be argued that the logical structure, so to speak the norma- tive algorithm of the UDHR norms — the aforemen- tioned ‘everyone has the right . . . ’ — implies that hu- mankind, not just single individuals, is to be the bearer of those rights, even if the collective singular is not used. Turning to a more substantive level, we could go as far as to say that the legal protection of humankind’s survival was implicitly enshrined as early as 1948 in the UDHR and later in the International Covenant on Civil and Political Rights (ICCPR) as well as the In- ternational Covenant on Economic, Social and Cultural Rights (ICESCR), both of 1966. Art. 28 UDHR (“ev- eryone has the right to a social and international order in which the rights and freedoms set forth in this Decla- ration can be fully realized”) could be rethought in the direction of institutions bound to implement for every- one, now and in the future, the right to life (Art.3 UDHR, Art. 6 ICCPR), the right to an adequate standard of liv- ing incl. adequate food (Art.11 ICESRC)40 as well as¶ the right of the family to be protected (Art.10 ICESRC), a right that would be denied to families of the posterity bound to live under insufferable environmental condi- tions (cf. above the notion of a transgenerational chain of parents). While the different binding strength of the several legal formulations (treaty, covenant, convention, declaration) cannot be ignored, it remains clear that le- gal documents do not advance by themselves the cause of humankind’s survival, except if they can be effec- tively referred to in a court of justice; but they create an appropriate and stable environment for what can really bring about a change, that is educational and political struggles, the former aiming at a change in the political culture.¶ To sum up, (hu)mankind has thus ceased to be just a concept used by philosophers and theologians, whose presence in international law was merely philo- sophical, if not rhetorical, as in the Preamble to the UN Charter of 1945. Though not explicitly endowed with rights in the documents quoted above, the humankind of the “common heritage” doctrine is an important prece- dent in the direction, suggested by this article, of in- troducing this new legal actor. When looking at the implementation of the rights that can be attributed to it, the other legal novelty of the “common but dif- ferentiated responsibility”41 of individual actors, such as countries, should also be brought to bear. This is important when it comes to distributing the burden of the duties corresponding to those rights – which is in- deed one of the major issues in the debate following the Copenhagen Accord on Climate Change of 2009. In any case, the legal acknowledgment of a “common responsibility” for the global commons is a further step in designing humankind as a juridical notion.¶ This article is policy-oriented in the peculiar sense of a constitutional policy that will require decades, if ever, to become the subject of debate and even longer to be legally implemented. Impulses in this direction are cer- tainly not be expected from the world of politics, but rather from the scientific community (provided a now utopian sounding collaboration of physics, philosophy and legal theory materializes) or from scattered sen- tences of national and international courts, particularly in environmental matter.42 Support from civil society would help.¶ Finally, the author’s suggestion as to how to read this proposal: it has a clearly cosmopolitan (or better: cosmopolitical) character, not however in the sense of cosmopolitanism as a general doctrine of government/ governance. It is rather generated by tools coming from realist thought: new threats as source of new rights, and lethal and planetary threats to the survival of hu- mankind’s civilization as drivers towards a new level of legal protection.

#### Consequentialism outweighs – a few reasons:

#### Only weighable mechanism – we can never evaluate or understand intent, only consequences are calculable

#### Intent based theories causes endless deferral of action – we can keep debating ethical minutia endlessly, but only applying real world consequences allows action to take place

#### Key to real world education – policy makers and institutions aren’t concerned with intents and are unable to use it, only our framework applies to larger governmental structures

#### Consequences are a prerequisite to intents – intents are determined and structured by the desired consequences

### Contention 1 – Space War

#### Private entities make accelerating space militarization inevitable

Jesús A. **Núñez Villaverde**, 10-21-**2021**, (Jesús A. Núñez Villaverde is an economist and a retired army officer. He is co-director of the Institute of Conflict and Humanitarian Action Studies, "Can the militarisation of space be avoided?," Equal Times, https://www.equaltimes.org/can-the-militarisation-of-space-be?lang=en#.YfHEJ\_7MJPY, Published 10-21-2021 Accessed 1-26-2022 Wally)

New **state and private competitors and the militarisation of space** The implosion of the USSR in December 1991 and the subsequent end of the Cold War paradoxically led to increased cooperation between the US and Russia. This was fuelled by economic interests and, above all, Washington’s fear that the deep crisis in which its main rival found itself would lead to the flight of Russian space scientists to North Korea or Iran. The result was a new era of collaboration that culminated in the International Space Station (ISS) when the Mir reached the end of its life in 2001. While the ISS is a joint endeavour involving 15 countries and remains active today, it would be a mistake to assume that the conquest of space has ceased to be an area of active military competition between major players. On the contrary, **this century has seen the space race take on new life, infused with new players and new features**. Additional countries with very ambitious objectives have joined the traditional competitors. Today, more than forty countries have active space programmes at different stages of development. Despite its considerable technical and economic resources, the European Union appears to have withdrawn from this competition due to its unwillingness to speak with one voice on the international stage. China, in contrast, has entered it with full force. While thousands of satellites already orbit the planet and navigation systems such as GPS, Galileo, Beidou and Glonass are already operational realities, **the most novel aspect of the new space race is the central role occupied by private business actors, with companies such as SpaceX (Elon Musk), Blue Origin (Jeff Bezos) and Virgin Galactic (Richard Branson) leading the way.** And while state actors continue to play an important role, public-private partnerships have become the new established framework for cooperation. In 2016, the space economy was already estimated to be worth around US$326 billion annually (three-fourths of which is accounted for by the private sector). Morgan Stanley projects that it will be worth US$1.2 trillion by 2040. Indeed, by reducing costs, until recently thought to be impossible, the competition between these private sector players, coupled with increasingly astonishing technological developments, is to a large extent making such projects feasible. As a result, both China (which landed a lunar rover on the far side of the moon in January 2019) and the United States are once again considering lunar missions (though the Biden administration has admitted that it will be impossible to go to the moon by 2024 with the Artemis programme). And the horizon continues to expand with plans to reach Mars and beyond. The goals of such missions include both prestige as well as more tangible benefits such as telecommunications, data acquisition, space mining and tourism. And while these aspects have attracted the bulk of media attention, **technological development applied to the militarisation of space continues unabated**. With countries such as Russia currently **engaged in the most ambitious programmes in their history to modernise their strategic arsenals, and with China catching up, this technological momentum suggests that the militarisation of space will be inevitable.** The only international treaty governing space law, the Outer Space Treaty, signed in 1967 with the express purpose of prohibiting the use of space for military purposes, does not appear to be a sufficiently adequate instrument for preventing it.

#### 3 Scenarios:

#### First Scenario is escalation - Militarization escalates to space conflict and nuclear use

Ramin **Skibba**, 7/12//**20** (Ramin Skibba is a Sand Diego Based astrophysicist and science writer. The ripple effects of a space skirmish. <https://www.theatlantic.com/technology/archive/2020/07/space-warfare-unregulated/614059/> Written 7/12/20, accessed 1/26/22. barnacle boy)

On April 22, after several failed attempts, Iran’s Islamic Revolutionary Guard Corps announced a successful launch of what it described as a military reconnaissance satellite. That satellite joined a growing list of **weapons and military systems in orbit**, including those from Russia (which in April tested a missile program designed to destroy satellites) and India (which launched an anti-satellite weapon in March 2019). Experts like Brian Weeden, director of program planning at the Secure World Foundation (SWF), a nonpartisan think tank based in Broomfield, Colorado, worry that these developments—all confirmed by the newly rebranded United States Space Force**—threaten to lift earthly conflicts to new heights** and **put all space activities**, peaceful and military alike, **at risk**. Researchers at SWF and at the Center for Strategic and International Studies (CSIS), a nonpartisan think tank in Washington, D.C., both released reports this year on the rapidly evolving state of affairs. The reports suggest that **the biggest players in space have upgraded their military** abilities, including satellite-destroying weapons and technologies that disrupt spacecraft, by, for instance, blocking data collection or transmission. **Many of these technologies**, if deployed, **could ratchet up an arms race and** even **spark a skirmish in space**, the SWF and CSIS researchers caution. Blowing up a single satellite scatters debris throughout the atmosphere, said Weeden, co-editor of the SWF report. Such an explosion could hurl projectiles in the paths of other spacecraft and threaten the accessibility of space for everyone. “Those are absolutely the two best reports to be looking at to get a sense of what’s going on in the space community,” said David Burbach, a national security affairs expert at the U.S. Naval War College in Newport, Rhode Island, who was not involved in the new research. Today, Burbach added, the world is very different compared with the Cold War era, when access to space was essentially limited to the United States and the Soviet Union. Many **more countries now have space programs,** including India, Iran, North Korea, France, Japan, and Israel. Despite this expansion—and the array of new space weapons—**relevant policies** and regulatory bodies have **remained stagnant. “**What worries us in the international community is that there aren’t necessarily any guardrails for how people are going to start interfering with others’ space systems,” said Daniel Porras, a space security fellow at the United Nations Institute for Disarmament Research in Geneva. “**There are no rules of engagement**.” The new reports use available evidence and intelligence to explore a range of weapons that various countries’ militaries are developing or testing—or already have operational. (Notably, CSIS’s report doesn’t include the American military.) Each nation has unique abilities and characteristics. For example, India has invested heavily in space infrastructure and capabilities, while Japan’s post–World War II space activities were limited until a recent change to its constitution. For Israel’s space program, Weeden said, little good data is available.Potential missile attacks on military satellites “tend to get most of the attention, but that is not all that we see happening around the world,” said Todd Harrison, director of the Aerospace Security Project at CSIS and a principal author of its report, during an April 6 livestream. For example, the **thousands of everyday satellites** that already circle low-Earth orbit, below an altitude of 1,200 miles, **could** potentially **suffer collateral damage**. More than half of those satellites are from the U.S.; many of the rest are from China and Russia. **They provide key services like internet access, GPS signals, long-distance communications, and weather information**. Any missile that smashes into a satellite—either as an attack or during a test—would disperse thousands of bits of debris. Any one of those pieces, still hurtling at orbital speeds, could take out another spacecraft and create yet more debris. “It’s very easy to pollute space,” Burbach said. “The debris doesn’t discriminate. If you create debris, it might just as well come back and hit one of your own satellites. So I think we’re pretty unlikely to see countries actually use those capabilities.” Still, he said, “it would be worrying to see countries showing off that [they] can do it and start testing.” When China conducted an anti-satellite missile test in 2007, it created a massive cloud of space junk that drew international condemnation. India’s engineers tried to limit debris from their recent test by conducting it at a low altitude, so that Earth’s gravity would pull the pieces down and they would burn up on descent. But some pieces were flung up to the International Space Station’s orbit. There were no collisions; as of February, only 15 trackable pieces of debris remained in orbit, said Victoria Samson, director of the Secure World Foundation’s Washington office, during the CSIS livestream in April. **A number of countries are developing new military technologies for space**. **France**, for instance, is working on laser beams that could dazzle another country’s satellite, preventing it from taking pictures of classified targets. **North Korea** is studying how to jam radio frequency signals sent to or from a satellite, and **Iran** is devising cyberattacks that could interfere with satellite systems. Meanwhile, the big three space heavyweights—the **U.S., Russia, and China**—are already capable of all three approaches, according to the SWF report. The big three have also begun to master what the reports call “rendezvous and proximity operations,” which involve using satellites as surveillance devices or weapons. A satellite could maneuver within miles of a rival’s classified satellite, snap photos of equipment, and transmit the pictures down to Earth. Or a satellite could sidle up to another and spray its counterpart’s lenses or cover its solar panels, cutting off power and rendering it useless. Russia may be ahead with this technology, having already launched a series of small “inspector satellites,” as the Russian government calls them. Last fall, according to Gen. John “Jay” Raymond, chief of space operations for the U.S. Space Force, one crept near a U.S. spy satellite, which he called a “potentially threatening behavior.” So far, there are relatively few international policies or norms about what’s allowed in modern-day space and what’s not. The SWF report notes that an incident or misunderstanding could escalate tensions if it’s perceived as an attack. The lack of guidance has left room for a range of activities. Weeden said that in December 2019, the Trump administration signaled its intention to strengthen the United States’ space weaponry and protect its spacecraft from possible attacks by Russia and China by transforming the Air Force Space Command into the U.S. Space Force. That shift “brought a full-time operational focus to the space domain, which was a needed change,” wrote Lieutenant Colonel Christina Hoggatt, a Space Force spokesperson, in a statement to Undark. With these forces, the Defense Department seeks to “strengthen deterrence” and improve capabilities to “defend our vital assets in space,” she wrote. This emphasis, Burbach said, likely means that the U.S. military will focus on making satellites more resilient to attack, rather than developing offensive weapons. Compared with the U.S., smaller space powers have fewer satellites and therefore less to lose, the U.N.’s Porras said. He argues that tense regional relationships could be particularly unpredictable. For example, he said, **if North Korea**n leaders **found themselves in a standoff with South Korea and the U.S., they might launch and detonate a nuclear weapon in space**; **its dangerous radiation would disable most satellites.** The U.N. and other international groups—including SWF and the Outer Space Institute, a global research organization based in British Columbia—are working to avoid such scenarios. Weeden said that as long as countries don’t launch destructive space weapons near other countries’ spacecraft, conduct overtly provocative tests, or disable critical satellites, peaceful space activities should continue. For now, he points out, countries have only tested missiles on their own defunct satellites, and exercises against other nations’ spacecraft have remained nondestructive. Existing international laws offer little guidance for modern military technology in space. While these rules—including the Partial Nuclear Test Ban Treaty of 1963 and the U.N.’s Outer Space Treaty of 1967—prohibit weapons of mass destruction in space, they don’t explicitly limit other kinds of space weapons, tests, or military space forces. Weeden points out that space diplomats could create new guidelines by developing something like the Incidents at Sea agreement, which the U.S. and the Soviet Union signed during the Cold War to maintain safe distances between ships and avoid maneuvers in heavy traffic. But until similar rules involving space weaponry are hammered out, he said, unexpected satellite tests will inevitably fuel speculation and paranoia. “Any time you have militaries operating near each other without a lot of transparency or clarity,” he added, “you always have the opportunity for misperceptions that could lead to something very bad.”

#### The Second Scenario is Earth miscalc – space militarization ensures it quickly goes nuclear---dual-use technology ensures nuclear and conventional entanglement.

**Bragg et al**, July 20**18** - \*Dr. Allison Astorino-Courtois, NSI’s Chief Analytics Officer (CAO) and Executive Vice President, PhD in IR @ NYU \*\*Dr. Robert Elder, PhD @ Emory, BA @ Clemson, Assistant prof of History @ Baylor \*\*\*Dr. Belinda Bragg, principle research scientist at NSI, Inc. Lecturer in polisci @ Texas A&M.;“Contested Space Operations, Space Defense, Deterrence, and Warfighting: Summary Findings and Integration Report,” NSI, https://nsiteam.com/social/wp-content/uploads/2018/11/Space-SMA-Integration-Report-Space-FINAL.pdf

Space is the ultimate gray zone

The nature of the space environment itself—and how humans tend to relate to it—can **pose risks to stable governance** and **crisis management** in the space domain (Wright; ViTTa Q16; Q19/23). Specifically, cognitive science tells us that ambiguous and high-stakes environments create **significant potential** for **misperception and miscommunication** (Wright). Physical and technical limitations on direct observation of events in space **limit space situational awareness** and **increase the difficulty** of **distinguishing** between intentional acts, unintentional events, and natural events. As a result, actors rely on other methods for understanding the nature and causes of events in space. Misperception, mistakes, and/or miscommunication can lead to incorrect inferences and either **unintended escalation** or unaddressed security threats. Managing escalation requires manipulating an adversary’s perception of the risks inherent in that escalation. However, the inherent ambiguity of the space domain makes effective communication of that risk **more complicated** (Wright). The “grayness” of the space domain is **intensified** by the **increase in dual-use** (military/civilian) **tech**nologies (Wright). For example, as a number of contributors pointed out, the same rocket engines used to boost satellites into orbit can be used to **deliver conventional or nuclear warheads** (ViTTa Q8; Q9: Q19/23). Partly in response to increasingly unstable regional security environments, **more and more actors** are starting to think about the national security applications of dual-use aspects of space technologies. Unlike the US, where there has traditionally been a clear division between civil, military, and commercial space industries, in most countries active in space, there is a more permeable division between government and commercial space. This creates **fewer institutional barriers to military use** of civil capabilities. In many non-Western states, commercial space enterprises are partially or even wholly state-owned (ViTTa Q2).

#### The Third Scenario is Chinese Cooperation – Pumping the breaks on militarization opens up avenues for cooperation on Space Situational Awareness

Bhavya **Lal et al**, 4-1-20**18**, Asha Balakrishnan Becaja M. Caldwell Reina S. Buenconsejo Sara A. Carioscia. “Global Trends in Space Situational Awareness (SSA) and Space Traffic Management (STM)” Institute for Defense Analyses, operates three Federally Funded Research and Development Centers. Accessed 9-2-2019. [https://www.ida.org/-/media/feature/publications/g/gl/global-trends-in-space-situational-awareness-ssa-and-space-traffic-management-stm/d-9074.ashx]/mnw

Some countries are pursuing SSA as a means to enable greater international cooperation and collaboration. They recognize that continued participation in the global space governance system may necessitate increased responsibility and have thus begun to contribute space data and assets (e.g., telescopes and radars formerly used for purposes other than SSA). For example, officials from both Poland and South Korea prioritize increased technical capabilities to allow for more data sharing opportunities with other friendly space powers; they note that having something to offer is integral to achieving strong relationships. Others (e.g., Chile, South Africa) see SSA as a way to contribute to international collaborations, using their strategic locations and capabilities as tools for cooperation in space, and on SSA specifically. **SSA can play a role in improving even established partnerships**. For instance, Germany seeks technical prowess to better contribute, no longer interested in being a junior partner in the U.S. SSA enterprise. Others want to contribute to regional efforts such as the EU SST and the ESA SSA programs. **Some nations see it as an opportunity to improve their relationships with the United States specifically** (such as Canada and Australia); for them, interoperability of any capabilities and systems in itself is an important SSA goal. It is also an opportunity to contribute to defense relationships. Interviewees from some countries, including Canada and Australia, believe that their countries need to do more to contribute to the global SSA regime, specifically in support of the U.S. They see increased domestic technical capabilities as an opportunity for burden-sharing. Japan wants to create a system to quickly share images and other data with the U.S. and intends to strengthen SSA capabilities by improving existing partnerships and collaborating with other friendly nations. Interestingly, **official Chinese documents state that SSA is an opportunity to foster international collaborations, and growing their leadership in the domain. For example, the Beijing Institute of Tracking and Telecommunications Technology (BITTT) noted that cooperation in outer space safety is a common interest China shares with the U.S., and suggests that such efforts could enhance mutual trust and support space cooperation** (BITTT 2017). Beyond **strengthening communication and coordination with the U.S**., the Institute also indicates Chinese interest in providing collision warning services for other countries that may need it. Although it is not emphasized in the open information from China, there is likely a national security motivation for Chinese SSA activities. Table 2-1 provides an overview of the rationales for doing SSA.

#### **US/China cooperation key to solving a host of global issues – from climate change to pandemics to global growth, only cooperation can stop multiple existential threats to the planet**

**Vogel, 2/3**

Ezra Vogel, Henry Ford II Professor of the Social Sciences at Harvard University, “Toward better management of US-China relations,” Global Times, 2/3/21, <https://www.globaltimes.cn/page/202102/1214898.shtml>, retrieved 2/21, JK

We can begin by 1) cooperating in areas that are of clear mutual interest, 2) taking steps that prevent our relations from getting worse, 3) agreeing on some basic principles to govern international institutions. Cooperating in areas of clear mutual interest a. Reopening of contacts that have been removed To deal with ongoing issues between the two countries we need enhanced contacts at four levels: top leaders; senior diplomats and military leaders dealing with major issues; working-level diplomats and specialists in various locations - in China, the US, and in international institutions, and in the private sector between business groups, academics, students, and other groups of private citizens. Top leaders: Fortunately, Xi Jinping, President of the People's Republic of China, and Joe Biden, President of the United States, have had numerous hours of contact when they were both vice presidents. They can set the general tone for relations between the two countries, begin to set the agenda for working-level cooperation on various issues, and lay the basis for addressing key policy issues. Political and military leaders: Fruitful meetings are already taking place between military representatives of the two countries on how to avoid accidents. Conversations should proceed on how our countries can avoid conflict over other issues, including Taiwan, the South China Sea, the Western Pacific, and nuclear proliferation in the Middle East and Northeast Asia. The US can reduce Chinese concerns about their security in the waters around China, while China should reassure the US and other countries about freedom of navigation in East Asian waters. Functional-level contacts: Dialogues between experts in our two governments have all but ceased, including contacts on health care, climate change, nuclear proliferation, energy security, international drug trafficking, and human trafficking. These contacts should be reopened quickly. This includes the reopening of the Chinese Consulate in Houston and the US Consulate in Chengdu, the restaffing of our respective embassies and consulates, and the revival of the Fulbright Program and the Peace Corps programs in China. Restrictions on journalist visas that have been put in place in the last several years should be removed. b. Cooperation on environmental issues China is currently the world's biggest polluter, but it has made a commitment to be carbon neutral by 2060 and has already made rapid progress in wind and solar development and in electric vehicles. The US has contributed more than any other country to current levels of atmospheric pollution. Biden has already committed to rejoining the Paris Accord. The commitment of both Beijing and Washington provides a basis for cooperation and for working with other countries to advance sharing of scientific information and advancing the control of global warming. Since air quality is now a major concern of China's leaders and US technology could contribute to Chinese environmental protection, the issue of air quality could be a good starting point for bilateral cooperation and for promoting world-wide cooperation to improve the global environment and combat climate change. c. Cooperation on public health, including control of pandemics Many Chinese and American specialists already cooperate on health issues. The US is ahead of China in many areas of medical science and healthcare delivery, but China is more advanced in the utilization of health data and digital healthcare. Furthermore, China's size and the prevalence of certain diseases enables it to make medical advances that could help Americans as well as citizens of other countries. Since the coronavirus is a global issue, cooperation between China and the US is essential to provide vaccines and medications for control of the virus throughout the world. Preventing further deterioration of relations It will take time to develop better relations between the two countries. It is important in the meantime that the two nations avoid further deterioration of relations. The two countries must above all avoid military conflict. This will require mutual adjustment to each other's security interests and strategic restraint. Second, despite extensive conflicts of economic interests, they must maintain robust economic relations and technological engagement. And they must cooperate to sustain global financial stability. The two countries should collaborate to ensure the stability of an evolving international monetary system. Third, the two countries must maintain cooperation on humanitarian efforts and educational exchanges.

### Contention 2 – Kessler Effect

#### Accelerating space exploration causes excess space junk – results in the Kessler syndrome where one rogue piece of debris can cascade causing a litany of problems – action now is key

**Kessler et al.,** 11-2-20**18** (Donald J. Kessler is an American astrophysicist and former NASA scientist known for his studies regarding space debris. Kessler first published his ideas in 1978, in an academic paper titled "Collision Frequency of Artificial Satellites: The Creation of a Debris Belt."The paper established Kessler's reputation, and NASA subsequently made him the head of the newly created Orbital Debris Program Office to study the issue and establish guidelines to slow the accumulation of space debris. In 2009, he gave an address to the first International Conference on Orbital Debris Removal in Arlington, Virginia, co-sponsored by NASA and DARPA. In 2011, he was a key adviser in the making of the educational IMAX film Space Junk 3D and also served as chairman of a United States National Research Council committee to assess NASA's orbital debris programs. In 2013, he gave a special lecture in Tokyo to the Second International Symposium on Sustainable Space Development and Utilization for Humankind, sponsored by the Japan Space Forum, and in 2017 gave the keynote address at the 7th European Conference on Space Debris. Kessler has received numerous awards for his pioneering work, the most recent being the 2010 Dirk Brower Award for his half-century career in astrodynamics. Dr. Holder Krag is Head of the Space Debris Office at the European Space Agency and has been a Space Debris Analyst in the Space Debris Office since 2006. He has worked on the operational conjunction event analysis for various ESA missions, debris risk assessment, mitigation analysis and the Surveillance and Tracking Segment of the European SSA system. He has also become ESA’s lead engineer for the implementation of the telescope network for the Spanish Surveillance System that will form part of the EU SST system. Asher Isbrucker is a Writer & Video Producer. "Kessler Syndrome: What Happens When Satellites Collide," Medium, https://medium.com/@asher.isbrucker/kessler-syndrome-what-happens-when-satellites-collide-1b571ca3c47e, 8-5-2019) AB

*This is a transcript of the documentary available at https://medium.com/@asher.isbrucker/kessler-syndrome-what-happens-when-satellites-collide-1b571ca3c47e.*

Donald Kessler: The worst case scenario is that you end up creating enough debris that it’s not cost-effective to depend on space. Now, that may take a long time, but because **it’s a non-reversible process**, once you’ve reached a certain threshold where you’re generating debris from these collisions faster than it can be cleaned out, it’ll just continually get worse unless you can do something drastic. Holger Krag: If we continue operating the way we do today, we will have a disaster in 50 years, in 100 years. It compares quite nicely to the CO2 issue, and the climate on ground, so it’s not our generation suffering from all the CO2 released into the atmosphere, it is **future generations**, but it is **our generation** that **has to take** the **action**. And the space debris problem is quite similar. DK: My name’s Don Kessler, I worked for NASA till 1996 as the senior researcher for orbital debris. I started the program back in 1979, and the program is still very active today. In the 1960s my main job was to define the interplanetary meteoroid environment. At the time, the only space debris NASA had to be concerned about were meteoroids, many of which are generated from collisions in the asteroid belt. These asteroid collisions are a cascading phenomenon, meaning every collision creates more ammunition for future collisions. It’s a positive feedback loop. Don was studying this phenomenon when he started to consider an interesting question: DK: When will the same phenomenon start happening in the Earth’s orbit? When will this same kind of cascading occur with satellites? And it was just a matter of curiosity as to what that number may be, and actually when I did the calculations, I was really shocked at the answer that it would happen so soon. Don published a paper in 1978 proposing this scenario, predicting that we’d start to see satellite collisions in Earth orbit by the year 2000. Just like in the asteroid belt, these satellite collisions would trigger a domino effect: creating a whole bunch of debris which **causes more collisions**, creating more debris, and so on. His main point: **once the process starts, it’ll be nearly impossible to stop**. This self-perpetuating phenomenon, this domino effect, became known as Kessler Syndrome. The first accidental collision occurred in 1996, when a French satellite was struck by a piece of a rocket thruster that had exploded ten years earlier, severing its stabilization boom and, for the first time, demonstrating how entangled the orbital environment has become. HK: In 2009 a collision happened that was by far more dramatic. The event he’s referring to was the first collision between two intact satellites: the Russian satellite Kosmos and an American Iridium. And that was the first catastrophic accidental collision that got everybody’s attention because not only did they realize how much debris is generated when something like that occurs but that **we are now entering this phase of what we’re calling the Kessler Syndrome**. Just two years earlier the Chinese military conducted a controversial anti-satellite test, intercepting one of their own defunct weather satellites with a kinetic kill vehicle — a non-explosive missile which relies on sheer speed of impact to destroy its target. It blew the satellite to smithereens and created just a huge mess, it was really bad. DK: And unfortunately it was something they should have known not to do. Yeah, that’s because the US did the same thing back in 1985 — the first anti-satellite test, with more or less the same results. DK: We at NASA tried to delay that or stop that because, we said it’s going to create enough debris that we’ll have to add more shielding to the space station which was planned to be launched a few years later. And nobody believed it would make that much debris, but it did. All of these collisions, accidental or otherwise, make a big mess of junk zipping around the Earth called space debris. It accounts for 95% of the objects in Low Earth orbit, and comes in all shapes and sizes. It’s technically defined as any nonfunctional object in orbit, so there’s big stuff like rocket thrusters and defunct satellites, but the vast majority are little bits and pieces called fragmentation debris. Many of these fragments come from explosions caused by residual fuel and other explosive energy sources self-igniting under the extreme conditions of space. These explosions happen more often than you might think, and as catastrophic and messy as these explosions are, collisions are even worse due to the incredible amount of kinetic energy involved. At the velocities objects travel in Lower Earth Orbit (speeds known as hypervelocity) even an object as tiny as a screw can deliver an incapacitating strike to a satellite. In fact, NASA has repeatedly had to replace shuttle windows due to hypervelocity impacts by flecks of paint. HK: These are velocities, we have no example nor anything that compares to that on ground. So the energy involved in these collisions is extremely high. A 1 cm object that size like a cherry hitting a satellite with 10 km/s, the energy released by this **corresponds roughly to an exploding grenade**. You can imagine what the satellite looks like after that. DK: Yes, let me know show you something. This is something that was shot in the lab, it’s a projectile about the size of a BB, and it makes a crater into, this is solid aluminum, and this was only going about 5 km/s, about half the speed of what you would expect in space. Most of this is happening in **L**ow **E**arth **O**rbit, the 2000 km strip of space above our heads where we’ve packed the vast majority of our satellites, including the **I**nternational **S**pace **S**tation and the Hubble Space Telescope. The most crowded section is between 500 and 1000 km up. It’s the densest region, it’s the Highway 401 of space. DK: And that’s what’s creating the problem because we’ve crowded so much stuff in that small region. And the probability of collision goes as the square of the spatial density. So you double the number of satellites, you get four times as many collisions. Now, the space station usually flies around 300 km but the debris that’s generated at that higher altitude is being thrown down and drifting down to the lower altitudes. HK: If you look at the space station surface you will find craters everywhere, impact craters caused by debris everywhere. Whenever you bring hardware down and inspect it on ground you find craters of all sizes. What do we do with this? How do you protect the life of the astronauts? The only thing you can do is shielding. And to protect against a hypervelocity impact you need a special type of lightweight shielding, called Whipple shielding. DK: Let me show you something else. The same particle that caused this kind of damage [image below, left] only caused this kind of damage [image below, right]on a surface with a very minor amount of shielding on it. And that’s, it’s almost a liquid splattered onto that. Most spacecraft utilize this type of shielding, which can withstand impacts from objects up to about one centimeter. Objects larger than a softball are catalogued and tracked by the US Space Surveillance Network. **Tracking is imprecise**, but allows spacecraft to dodge some of the debris that comes too close. This only works for objects larger than 10 cm or so. **Anything smaller can’t be reliably tracked.** For that reason, the most concerning objects are those between 1 and 10 cm; too large for shielding to withstand and too small to be tracked. **These objects could incapacitate any spacecraft in their path, or worse**. And **with every future explosion and collision there will be more and more of these invisible projectiles going around.** The problem gets worse when you consider how long objects can remain in orbit. Depending on altitude, debris in Low Earth Orbit may remain there for years, decades, or centuries before their orbit naturally decays enough to re-enter the Earth’s atmosphere. For example, look no further than ENVISAT; a defunct 8-tonne satellite operated by the European Space Agency until it lost contact in 2012, becoming a massive piece of space junk in the densest region of Earth orbit. ENVISAT will remain in orbit for 200 years if not removed. Experts hope to avoid an encore of ENVISAT and to mitigate Kessler Syndrome through the international adoption of two clean space policies. The first will prevent explosions by requiring so-called passivation of onboard energy sources. HK: Meaning, residual fuel must be either depleted, burned, released through a valve, whatever. That’s number one: no more explosions. DK: And the other is what we call a 25 year rule. Once you put something in orbit, after you finish using it you have 25 years to get it out. Either by moving up to a designated “graveyard orbit” where it will pose minimal risk to active spacecraft or more ideally, lowering its altitude so it will burn up in the atmosphere sooner. These policies aren’t difficult to follow and are beginning to be adopted internationally. HK: When we do these two things that would already make space flight pretty safe for the future. It would mean, if we do this systematically, the risk in the future would be almost the same as it is today. The mitigation measures they help to dampen the effect of the Kessler Syndrome, we are not talking about stopping it, we are talking about maintaining it on an acceptable level, the growth. But it will grow, even if we implement these two measures strictly. If we want to even prevent this growth, then we need to do active removal. DK: We’ve already concluded that it’s going to take something like removing 500 intact objects over the next 100 years in order to stabilize the Low Earth Orbit environment again. That works out to five objects per year for the next century, which at least seems achievable, right? The challenge though is that there’s no easy way to remove space debris. HK: We need to approach the object that are not under control anymore, and attach to them, dock with them, rendezvous them, capture them somehow, and then get rid of them in a controlled way. You can imagine this is not so easy. Experts are working on ways to remove debris, and there are several promising ideas in early development. There are reusable concepts like tethers and space tugs which can grab multiple objects per launch, which saves money. There are ground- or space-based lasers which can deorbit objects by kind of shooting them down, but these face political challenges. There are actually active satellites in space right now, the University of Surrey is controlling a spacecraft called RemoveDEBRIS which will use a harpoon to grab on to debris, that’s promising. And there’s another single-use option like ESA’s e.Deorbit, currently planned to retrieve and deorbit ENVISAT in 2023. Many of these ideas aren’t scalable, though, that’s the problem, they’re expensive and complicated, and missions like these are almost completely unprecedented. The pressure is on, though, because Kessler Syndrome isn’t waiting, and the consequences for space infrastructure are dire. HK: Today only half of the satellites actually disappear from space within the 25 years that are recommended as the maximum on orbit time. We still have five explosions every year. If we continue and not improve the way we do spaceflight, **then in a few decades** some regions of **space might not be useable** anymore for spaceflight, or it might be much too risky to go there. And that might mean that we either lose services from space that we rely on today, or they get more expensive. AI: Do you think something like Kessler Syndrome is inevitable? Are you optimistic that this can be managed properly, or do you think this is an inevitable issue for a spacefaring society? HK: I think it can be managed, it can be managed. I do believe **it’s time** for young people **to take charge** and there’s a lot of work to be done, and there’s enough people involved today that I’m confident that it’s going to be done. Much like other environmental and generational problems, Kessler Syndrome is invisible to us. When you look up at the night sky, you don’t see collisions and explosions and fragments of debris. If you’re lucky and the conditions are right, you might see one white speck drifting across the sky, a tiny testament to humankind’s highest collective ambitions. **But that speck is at risk, along with all it represents, if we don’t address this invisible problem — because Kessler Syndrome isn’t waiting.**

#### Kessler syndrome ensures extinction---satellites solve every impact. It’s specifically key to military readiness and preventing a financial crash.

George **Dvorsky 15**. Senior Staff reporter at Gizmodo. "What Would Happen If All Our Satellites Were Suddenly Destroyed?" <https://io9.gizmodo.com/what-would-happen-if-all-our-satellites-were-suddenly-d-1709006681>.

Lastly, **there’s the** [**Kessler Syndrome**](http://www.spacesafetymagazine.com/space-debris/kessler-syndrome/) **to consider**. This scenario was portrayed in the 2013 film Gravity. In the movie, a Russian missile strike on a defunct satellite inadvertently causes a cascading chain reaction that formed an ever-growing cloud of orbiting space debris. Anything in the cloud’s wake — including satellites, space stations, and astronauts — gets annihilated. Disturbingly, the Kessler Syndrome is a very real possibility, and the **likelihood of it happening** [**is steadily increasing as more stuff gets thrown into space**](http://io9.com/how-to-clean-up-deadly-space-junk-before-disaster-strik-1443463338). Given these grim prospects, it’s fair to ask what might happen to our civilization if any of these things happened. At the risk of gross understatement, the complete loss of our satellite fleet would instigate a **tremendous disruption to our current mode of technological existence** — disruptions that would be experienced in the short, medium, and long term, and across multiple [domains](https://io9.gizmodo.com/what-would-happen-if-all-our-satellites-were-suddenly-d-1709006681). Compromised Communications Almost immediately we’d notice a dramatic reduction in our ability to communicate, share information, and conduct transactions. “If our communications satellites are lost, then bandwidth is also lost,” [Jonathan McDowell](http://planet4589.org/) tells io9. He’s an astrophysicists and Chandra Observatory scientist who works out of the [Harvard-Smithsonian Center for Astrophysics](http://planet4589.org/jcm/cfa-www.harvard.edu). McDowell says that, with telecommunication satellites wiped out, the burden of telecommunications would fall upon undersea cables and ground-based communication systems. But while many forms of communication would disappear in an [instant](https://io9.gizmodo.com/what-would-happen-if-all-our-satellites-were-suddenly-d-1709006681), others would remain. All **international calls and data traffic** would have to be re-routed, placing tremendous pressure on terrestrial and undersea lines. Oversaturation would stretch the capacity of these systems to the limit, preventing many calls from going through. Hundreds of **millions of Internet connections would vanish**, or be severely overloaded. A similar number of cell phones would be rendered useless. In remote areas, people dependent on satellite for television, Internet, and radio would practically lose all service. “Indeed, a lot of television would suddenly disappear,” says McDowell. “A sizable portion of TV comes from cable whose companies relay programming from satellites to their hubs.” It’s important to note that we actually have a precedent for a dramatic — albeit brief — disruption in com-sat capability. Back in 1998, [there was a day in which a single satellite failed and all the world’s pagers stopped working](http://articles.latimes.com/1998/may/21/news/mn-52190). Get Out Your Paper Maps We would also **lose the Global Positioning System**. In the years since its inception, GPS has become ubiquitous, and a surprising number of systems have become reliant on it. “Apart from the fact that everyone has forgotten to navigate without GPS in their cars, many airplanes use GPS as well,” says McDowell. Though backup systems exist, airlines use GPS to chart the most fuel-efficient and expeditious routes. Without GPS and telecomm-sats, aircraft controllers would have tremendous difficulty communicating with and routing airplanes. Airlines would have to fall back to legacy systems and procedures. Given the sheer volume of airline traffic today, **accidents would be all but guaranteed**. Other affected navigation systems would include those aboard cargo vessels, supply-chain management systems, and transportation hubs driven by GPS. But GPS does more than just provide positioning — it also provides for timing. Ground-based atomic clocks can perform the same function, but GPS is increasingly being used to distribute the universal time standard via satellites. Within hours of a terminated service, any distributing networks requiring tight synchronization would start to suffer from “clock drift,” leading to serious performance issues and outright service outages. Such **disruptions could affect everything from the power grid through to the financial sector**. In the report, “[A Day Without Space: Economic and National Security Ramifications](http://marshall.org/wp-content/uploads/2013/08/Day-without-Space-Oct-16-2008.pdf),” Ed Morris, the Executive Director of the Office of Space Commerce at the Department of Commerce, writes: If you think it is hard to get work done when your internet connection goes out at the office, **imagine losing that plus your cell** [**phone**](https://io9.gizmodo.com/what-would-happen-if-all-our-satellites-were-suddenly-d-1709006681)**, TV, radio, ATM access,** [**credit cards**](https://io9.gizmodo.com/what-would-happen-if-all-our-satellites-were-suddenly-d-1709006681)**, and** possibly even your **electricity**. [...] Wireless services, especially those built to [CDMA standard](http://www.protocols.com/pbook/cellular.htm), would fail to hand off calls from one cell to the next, leading to dropped connections. Computer networks would experience slowdowns as data is pushed through finite pipelines at reduced bit rates. The same would be true for major networks for communication and entertainment, since they are all IP-based today and require ultra-precise timing to ensure digital traffic reaches its destination. The lack of effective synch would hit especially hard in banking, where the timing of transactions needs to be recorded. Credit card payments and bank accounts would likely freeze, as billions of dollars could be sucked away from businesses. **A financial crash is not out of the question.** The **Loss of Military Capability** The sudden loss of satellite capability would have a profound effect on the military. The Marshall Institute puts it this way: “Space is a **critical enabler** to all U.S. warfare domains,” including intelligence, navigation, communications, weather prediction, and warfare. McDowell describes satellite capability as as **the “backbone” of the U.S. military.** And as 21st century warfare expert [Peter W. Singer](http://www.pwsinger.com/biography.html) from [New America Foundation](https://www.newamerica.org/) tells io9, “He who controls the heavens will control what happens in the battles of Earth.” Singer summarized the military consequences of losing satellites in an email to us: Today there are some 1,100 active satellites which act as the nervous system of not just our economy, but also our military. Everything from communications to GPS to intelligence all depend on it. Potential foes have noticed, which is why Russia and China have recently begun testing a new generation of anti-satellite weapons, which in turn has sparked the U.S. military to recently budget $5 billion for various space warfare systems. What would happen if we lost access to space? Well, the battles would, as one U.S. military officer put it, take us back to the “pre digital age.” Our **drones, our missiles, even our ground units wouldn’t be able to operate** the way we plan. It would **force a rewrite** of all our assumptions of 21st century high tech war. We might have a new generation of stealthy battleships...but the loss of space would mean naval battles would in many ways be like the game of Battleship, where the two sides would struggle to even find each other. Moreover, and as McDowell explains to io9, the loss of satellite capability would have a **profound effect on arms control capabilities.** Space systems can monitor compliance; without them, we’d be running blind. “The overarching consideration is that you wouldn’t really know what’s going on,” says McDowell. “Satellites provide for both global and local views of what’s happening. We would be less connected, less informed — and with considerably degraded situational awareness.” Compromised Weather Prediction and Climate Science One great thing satellites have done for us is improve our ability to forecast weather. Predicting a slight chance of cloudiness is all well and good, but some areas, like India, Pakistan, and Bangladesh, are dependent on such systems to predict potentially hazardous monsoons. And in the U.S., the NOAA has estimated that, during a typical hurricane season, weather satellites save as much as **$3 billion in lives and property damage.** There’s also the effect on science to consider. **Much of what we know about climate change comes from satellites.** As McDowell explains, the first couple of weeks without satellites wouldn’t make much of a difference. But over a ten-year span, the lack of satellites would preclude our ability to understand and monitor such things as the **ozone layer**, **carbon dioxide levels**, and the **distribution of polar ice**. Ground-based and balloon-driven systems would help, but much of the data we’re currently tracking would suddenly become much spottier. “We’re quite **dependent on satellites** for a global view of what’s happening on our planet — and at a time when we really, really need to know what’s happening,” says McDowell. It’s also worth pointing out that, without satellites, we also wouldn’t be able to monitor space weather, such as incoming space storms. Time to Recover With all the satellites gone, both governmental and private interests would work feverishly to restore space-based capabilities. Depending on the nature of the satellite-destroying event, it could take decades or more to get ourselves back to current operational standards. It would take a particularly long time to recover from a Carrington Event, which would zap many ground-based electronic systems as well. The U.S. military is already thinking along these lines, which is why it’s working on the ability to quickly send up emergency assets, such as small satellites parked in Low Earth Orbit (LEO). Cube satellites are increasingly favored, as an easy-to-launch, affordable, and effective solution — albeit a short-term one. The U.S. Operationally Responsive State Office is currently working on the concept of emergency replenishment and the ability to “rapidly deploy capabilities that are good enough to satisfy warfighter needs across the entire spectrum of operations, from peacetime through conflict.” As for getting full-sized, geostationary satellites back into orbit, that would prove to be a greater challenge. It can take years to built a new satellite, which typically requires a big, costly rocket to get it into space. Lastly, if a Kessler Syndrome wipes out the satellites, that would present an entirely different recovery scenario. According to McDowell, it would take a minimum of 11 years for LEO to clear itself of the debris cloud; any objects below 500 km (310 miles) would eventually fall back to Earth. Thus, we would only be able to start re-seeding LEO in a little over a decade following a Kessler event. Unfortunately, the area above 600 km (372 miles) **would remain out of touch for a practically indefinite period of time**; objects orbiting at that height tend to stay there for a long, long time. We’d probably **lose this band for good** — unless we manually removed the debris field, using clean-up satellites or other techniques. It’s worth noting that a single Kessler event could hit the LEO zone or the GEO zone (geosynchronous orbit) but realistically not both; LEO debris could never reach GEO, and vice versa — though a spent rocket in GTO (geosynchronous transfer orbit) or SSTO (supersynchronous transfer orbit) passes through or near both zones and could potentially affect either of them. The spent rockets in GTO do not stay too close to the GEO arc for long due to orbital perturbations, so a GEO Kessler event is very unlikely to be triggered by one of them. Suffice to say, we should probably take the prospect of a Kessler Syndrome more seriously, and be aware of what could happen if we’re no longer able to use these spaces.