

The Invisible Rainbow & 5G Technology

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Frank de Vocht

“The only thing that I thought could have been delved into in much greater detail - and perhaps this will be in the next book - is the huge conspiracy to bury this issue and pretend that nothing's actually wrong - the key individuals and organizations behind this, their methods, their vulnerabilities, their conflicts of interest and motivations, and so on.”

Dave, UK Blogger

“Considering the very low exposure levels and research results collected to date, there is no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects.”

World Health Organization (2006)
Electromagnetic Fields and Public Health

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Introduction

The great pandemic of 2020 has generated many alternative theories have sprung up all over the place. From the middle of March to the middle of April 2020, I put together a document titled *Alternative Narratives* that collected many narratives outside those of the national media and the administration on the virus. (Write me at johnfrain@mac.com for a PDF of this document)

Of course all narratives outside the news we are fed 24/7 are never given more validation than being simply a “theory” and a “conspiracy theory” at that. In the alternative narratives I collected during the month period, I heard more and more talk about the relationship of the Covid-19 virus to the introduction of 5G technology in China.

A recent republication of the 2017 book *The Invisible Rainbow* by Arthur Firstenberg (Chelsea Green Publishing, Vermont) adds much information to the 5G conspiracy theory.

This document starts with a few reviews of the book and expands to another key book in this genre. Then, it expands to key organizations in the fight against cellular and microwave technology in general and the latest appearance of this technology in 5G. Most of these organizations have not suddenly come into being after the Covid-19 pandemic but have been lobbying our leaders (largely unheard) for many years.

After listing some of these key organizations, we reprint some articles in this area. There are many and these are only a small handful.

This document ends with a statement of many respected scientists warning of the dangers of cell phones and micro-wave radiation.

Altogether, it is little more than a sampling of global efforts to stop the implementation of 5G technology. Whether it is the real culprit behind the Coronavirus or not is something for another time. If in fact we are given another time to figure all of this out.

1. Books

The Invisible Rainbow: A History of Electricity and Life

Arthur Firstenberg

AGB Press. 2017. (pp. 558). Paperback (ISBN:
978-0-692-68301-9). \$35.

Conservation and Society 17(1): 118-119, 2019

Frank de Vocht

Does electricity have any detrimental effects on plants, humans and other animals, and if so how much of a problem is this and why is it not a much bigger concern to us, are the main questions which Arthur Firstenberg aims to answer in his book 'The Invisible Rainbow. A History of Electricity and Life'. To understand the *raison d'etre* for writing this book, it is important to realise that its writer, a researcher, journalist and consultant, as well as a practitioner of “several healing arts”, experiences the effects of self-diagnosed electro-hypersensitivity. As such, *The Invisible Rainbow*, is not only a work of popular science aimed at providing a historical account of the introduction of electricity into society and describing, based on early warnings about side effects of electric shocks and scientific experiments on humans, other animals, and plants, how this may affect biological systems, it is also a campaigner's warning about the consequences of the ubiquitous presence of electricity for human health and the environment.

The Invisible Rainbow is divided in two parts, entitled 'From the Beginning...' and '...To the Present'; roughly corresponding to a description of the history of how electricity became ubiquitous in modern society, interwoven with descriptions of historic experiments of effects of electricity on plants and humans in part 1, and a discussion of health effects on humans and the environment more generally, and their alleged associations with exposure to electricity in more modern times in part 2. The reason I am referring to 'alleged' associations in relation to the second part of the book is that it builds the argument regarding the detrimental effects of electricity on human health for a considerable part on work by Dr Milham. His work, described in his book *Dirty Electricity: Electrification and the Diseases of Civilization* (ISBN 978-1938908187) and related peer-reviewed papers, although thought-provoking, is one of correlations rather than causations and relies on weak epidemiological evidence. Although I specifically highlight the link to Dr Milham's

work, because I am most familiar with the epidemiology, and have discussed inherent weaknesses in these data and the analytic method previously (de Vocht and Burstyn 2014), this relates to a broader issue regarding the scientific arguments made in *The Invisible Rainbow*: evidence is systematically brought together from a wide variety of sources spanning over 200 to 300 years but is of very varying quality. This should not necessarily be a problem, but unfortunately the synthesis of all these studies, anecdotal evidence and other sources of data, relies on supporting the central thesis of the book rather than on the scientific rigour and quality of data. Evidence from rigorous experiments are combined on par with results from studies that are, at best, fringe science, and are supplemented with anecdotes. As a result, it is difficult for readers, especially those unfamiliar with scientific enquiries in general, are new to this field, or who are unfamiliar with adjacent disciplines to their own, to infer how robust the scientific basis is for claims made in the book.

Nonetheless, despite misgivings, Firstenberg expands on Dr Milham's work significantly in terms of the inference and triangulation of different areas of science and relates the correlations described by Dr Milham to other epidemiological and mechanistic studies to strengthen the argument that electricity may have a part to play in the observed disease trends. This is a considerable strength of this book: whereas much of the work in this area is limited by the absence of credible biological mechanisms that could explain the correlated phenomena, *The Invisible Rainbow* goes to great lengths to provide explanations of how, at least theoretically, exposure to non-ionising radiation would link to health and environmental effects. Of course, the studies by Milham are also by no means the only evidence on which Firstenberg's thesis is built, and as such this book is a very detailed and rigorous work and succeeds in advancing the original arguments.

An additional concern with respect to the inference made by Firstenberg, is that many of the studies used to support the book's central thesis, especially those describing experiments, were conducted several decades (and often over a century) ago. This is not a problem by itself as scientific studies, if not falsified, remain as much scientific evidence as more recent studies; however, here they are generally presented as of equivalent if not stronger evidence than recent studies. Arguably, the scientific method, including accuracy and precision of measurement, has made great leaps forward over that time period.

As a result of these issues, to accept the thesis of '*The Invisible Rainbow*' the reader has to accept two important preconditions—1) there have been no

significant improvements in the quality of research in the last (at least) 100 years, and 2) there has been a worldwide conspiracy started soon after the introduction of electricity in society and lasting to present day dedicated to hiding the true impact on health from non-ionising radiation. Personally, I do not find these two preconditions very convincing, at least not to the extent required to accept the book's conclusions, but other readers may be more willing to accept these. If you are willing to accept these preconditions, then 'The Invisible Rainbow' is a great book. It is probably one of the most detailed and best researched ones on the topic, and the arguments laid out in the book are clear and concise. If you are however, like me, not that willing to accept these in their totality, this is still a very interesting book on the history of electrification and possible effects on humans and the environment. In addition, it is also very well written.

It is however worth pointing out that although electromagnetic radiation includes a wide spectrum of different types of radiation (including for example Extremely Low Frequency (ELF) and Radio Frequency (RF) radiation, but also visible light) as well as different possible exposure levels and sources – and which have different effects on biological materials - this distinction is rarely made. Electricity is treated as a generic concept throughout, but it is left up to the reader to work out, which is sometimes difficult, whether a specific paragraph refers to ELF, RF or other frequencies. A possible way of working this out is to refer to the original source materials, which are provided in the extensive Notes and Bibliography (169 pages).

Regardless, the writing style is pleasant, the arguments are laid out in a clear and concise manner, and the book is aimed at the general public. So as a work of popular science it deserves a place on the shelves. It is, of course, not just a work of popular science. 'The Invisible Rainbow' is also a call to arms. It is a call to recognise that biology is not just about chemistry, but also about electricity, it is a call to recognise that electrification of society could have effects on humans, animals and the environment more general, and most of all it is a call to arms for the recognition of electro hypersensitivity and to study this more and better. And in these calls to arms, Firstenberg has been very successful.

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Frank de Vocht (Dr Frank de Vocht is a member of the COMARE committee in the UK, which guides the Government on issues relating to ionising and non-ionising radiation)

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The Invisible Rainbow: A History of Electricity and Life Arthur Firstenberg

<https://beingelectrosensitive.blogspot.com/2019/12/book-invisible-rainbow-history-of.html>

December 4, 2019

This book, written by Arthur Firstenberg in 2017, is one of the definitive texts on electrosensitivity, in all of its different shapes and forms. The 'Invisible Rainbow' of the title refers to electricity and the electromagnetic spectrum, most of which is completely invisible to humans, apart from a tiny portion of it which we can perceive as visible light; the colours of the rainbow.

Just as most of the electromagnetic spectrum cannot be seen with the naked eye, so it seems that 'electrosensitivity' is invisible to most non-sufferers. Symptoms arising from chronic exposure to electromagnetic fields (EMFs) and radiation in the environment are probably experienced by most, if not all, people, and yet - officially - these harmful effects don't even exist, or else they are given to different causes.

As well as writing this book in 2017, Arthur Firstenberg has launched the INTERNATIONAL APPEAL to Stop 5G on Earth and in Space, which to date has been signed by 183,714 signatories from 208 nations and territories (as at 2nd December 2019).

<https://www.5gspaceappeal.org/the-appeal>

This Appeal is an urgent call to the UN, the World Health Organisation, the EU, the Council of Europe, and worldwide governments, to take action:

'We the undersigned scientists, doctors, environmental organizations and citizens from () countries, urgently call for a halt to the deployment of the 5G (fifth generation) wireless network, including 5G from space satellites. 5G will

massively increase exposure to radio frequency (RF) radiation on top of the 2G, 3G and 4G networks for telecommunications already in place. RF radiation has been proven harmful for humans and the environment. The deployment of 5G constitutes an experiment on humanity and the environment that is defined as a crime under international law.'

With proceeds from the sale of this book going towards the costs of the 5G Appeal, I thought that now was a good time to write a short post to remind people about this excellent book, and especially so in the run-up to Christmas. The book definitely isn't cheap, and it's not widely available, but it is well worth searching out.

My own comments, posted in a Facebook group:

I found it extremely well-researched, well-written, and generally/genuinely fascinating; I certainly learnt a lot of things about electricity and electrosensitivity that I didn't know before.

As others have mentioned elsewhere, it's got a fascinating chapter called "Porphyrins and the Basis of Life", although I really need to re-read this to take it all in. I remember feeling that I was on the verge of an epiphany on reading it for the first time...!

Arthur describes some pretty spectacular and persuasive correlations between EMFs and a variety of diseases, including, topically, influenza. I guess that this sort of thing will be familiar to anyone who has read Sam Milham's book - especially when it comes to the so-called diseases of civilisation.

So yes, a riveting, eye-opening read, and up there with *The Body Electric* by Robert Becker I think (although thankfully without acres of felled woodland devoted to the subject of amputated salamanders...!).

The only thing that I thought could have been delved into in much greater detail - and perhaps this will be in the next book - is the huge conspiracy to bury this issue and pretend that nothing's actually wrong - the key individuals and organisations behind this, their methods, their vulnerabilities, their conflicts of interest and motivations, and so on.

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The Invisible Rainbow: A Review and Appreciation

By Miriam Lindbeck, EMRS

Arthur Firstenberg, scientist, researcher, journalist, mathematician, and health practitioner, obtained his mathematical degree from Cornell University where he graduated Phi Beta Kappa, and in 1982 had his medical career at UC Irvine cut short from an X-Ray overdose. For the past 34 years, he has been a researcher, consultant and lecturer on the health and environmental effects of EMFs. Today, he leads the fight against the roll out of 5G in Santa Fe, NM, and spearheads the Cell Phone Task Force, committed to increasing public awareness to the dangers of cell phones and man-made radiations.

The Invisible Rainbow, is the first and only book of its kind in this field. That's a daring statement, I understand, given the immense body of work that currently exists in this field. May I present the following for your consideration?

1. If you have read actual scientific papers, or reports on the findings from research, the reading is, by necessity, slower and painstakingly technical. In contrast, *The Invisible Rainbow*, though a deadly serious, scholarly work, reads like a thriller. Bearing medical and scientific detail not published in readily accessible works, it's unlike any book I have ever read. It is an adventurous, hair-raising, fog dispelling, centuries-long sweep of electrical history and life, starting in the 1700's and ending in the moment we finish reading the book.
2. The information Firstenberg puts forth has never before been compiled, revealed or associated as he has done. It takes into account the existing research and data and adds more information and connections not before revealed. The fact that it takes us to the moment when electricity was discovered and leaves us off right now, that in and of itself, has not been done before. The result will surprise and even startle you. It is a vastly comprehensive work, presenting new details, data and history of such a shocking yet factual nature, it is clear he needed twenty years to produce this opus.
3. History alone as we know it, is often special interests' carefully crafted reports, deliberate obfuscation, denial and secrecy. Firstenberg takes the last near-three centuries and brings into clear view the scattering of information, the loss of vital records, the plans of industry and every resulting outcome on health and

life. He then accurately and stunningly rewrites that history depositing readers into a new reality.

4. He digs below the false floor and ferrets out the complete truth. In a brilliant, stunning exposure, Firstenberg couples electrical history with the exhaustive scientific and medical data and connects them in staggering cause and effect, as no other scientist or historian ever has. The gestalt will stun even the most educated in the field. His treatment and holistic view of this extensive and shocking impact on all life forms, including the Cosmos, it's truly jaw-dropping. It is rare to find lettered work spellbinding, furiously fast, and motivating. In a single tome, the author compresses two hundred and seventy one years of complexity, complication, death and distraction into the leviathan it is. I could not put this book down, even when my eyes were burning and I needed sleep.

5. Yet it is not just this, nor the immense expanse of time and history Firstenberg covers that distinguishes his work from all other works before him. Those reasons indeed, are substantial enough. Firstenberg is a Seer in the same way as Rachel Carson. If we continue down the path of life exponentially increasing the roll out of man-made radiation as industry demands and people want, Firstenberg predicts in a stunningly short period of time, we will destroy this earth, our atmosphere and ionosphere, and life as we know it, will end. We can't let that happen.

* * *

Thrusting us back to 1746, the author propels us down a hidden historical and revelatory road starting us off with the life-changing discovery of static electricity:

“The experiment of Leyden was a craze that was immense, universal: everywhere you went people would ask you if you had experienced its effects. The year was 1746. The place, any city in England, France, Germany, Holland, Italy. A few years later,

America. Like a child prodigy making his debut, electricity had arrived, and the whole Western world turned out to hear his performance.

“His midwives—Kleist, Cunaeus, Allamand, and Musschenbrock—warned that they had helped give birth to an enfant terrible, whose shocks could take away your breath, boil your blood, paralyze you. The public should have listened, been more cautious. But of course the colorful reports of those scientists only encouraged the crowds.”

Graphically, eyes wide open missing nothing, Firstenberg hikes us, year by year, decade by decade, through elaborate scientific and medical discoveries, the biases and positions of doctors and physicists, the wholesale roll out of electricity and radio waves, the undeniable biological correlations, and the complete, staggering, parallel health repercussions it had and continues to have on all life forms, both visible and invisible. He opens the vaults of buried history, casting the flood light on what was long concealed, the impact of which determines our lives today. He marches us towards the future which is here now, with what is to become far worse, literally in months. We now consciously hold in our hands the dangerous and complicated situation we have been creating since the day the enfant terrible was discovered and placed into the then, and still, unwitting hands of humanity.

There is no more time to be unwitting. Firstenberg makes it clear; time has collapsed. Covering the history of military radio waves and its ramifications for life, he updates us on what is imminent before 2020. The facts and data in this book, from beginning to end, are undeniably, some of the most timely and critical particulars we can obtain.

The Table of Contents exposes us immediately to unexpected information, unforeseen turns of events and their interconnection :

Part 1—From the beginning...:

Captured in a Bottle; The Deaf to Hear, and the Lame to Walk; Electrical Sensitivity; The Road Not Taken; Chronic Electrical Illness; The Behavior of Plants; Acute Electrical Illness; Mystery on the Isle of Wight; Earth's Electric Envelope; Porphyrins and the Basis of Life.

Part 11—...To the Present:

The Irritable Heart; The Transformation of Diabetes; Cancer and the Starvation of Life; Sus-pended Animation; You mean you can hear electricity?; Bees, Birds, Trees, and Humans; In the Land of the Blind.

A suspenseful and seriously requisite work, what unfolds in Firstenberg's book beginning with page one unravels what we thought we knew. Even the most educated in this field will have their eyes opened. Not just another EMF book, it is an intimately interconnected and prophetic work. Firstenberg's investigations and reporting is a clarion call to action. He has lifted the injured up into the sun pleading their case, and accurately rewritten the history of nearly the last three centuries, so we can finally see. He puts it upon himself and us to turn this horrific

situation around. Now, we can only rewrite the future with the pen of action. We have run out of time.

To all potential readers, I strongly encourage you to buy and read Arthur's book. It's not a doomsday book. It is an empowering read, an education beyond anything one can imagine. It is a call to wake up and rise to our feet. We need and deserve that. Beyond everything else this book imparts, *The Invisible Rainbow* also bestows a unique and powerful grace upon the reader—the personal motivation to make your own, unique contribution now, to your people, to yourself, to the earth, helping it to heal, to be a safer place to live, to return to it its magnificence we took away, and to keep its glory for always and all time—before it's too late.

In Gratitude.

Arthur Firstenberg, you are a true virtuoso, catalyst, and Brave. You are a Causal Force in our world. Your unequivocal commitment to serve the earth and lead humanity to safety is extraordinary. Your message could not have arrived at a more auspicious time. We are fortunate to have you in our midst. Our most substantial thanks will be best expressed by our active contribution to save our lives and the life of this magnificent earth.

Namaste, Miriam

Dirty Electricity: Electrification and the Diseases of Civilization

Dr. Samuel Milham

<https://www.amazon.com/Dirty-Electricity-Electrification-Diseases-Civilization/dp/193890818X>

When Thomas Edison began wiring New York City with a direct current electricity distribution system in the 1880s, he gave humankind the magic of electric light, heat, and power; in the process, though, he inadvertently opened a Pandora's Box of unimaginable illness and death. *Dirty Electricity* tells the story of Dr. Samuel Milham, the scientist who first alerted the world about the frightening link between occupational exposure to electromagnetic fields and human disease. Milham takes readers through his early years and education, following the twisting path that led to his discovery that most of the twentieth century diseases of civilization, including cancer, cardiovascular disease, diabetes, and suicide, are caused by electromagnetic field exposure. In the second edition, he explains how electrical exposure does its damage, and how electricity is causing our current epidemics of asthma, diabetes and obesity. Dr. Milham warns that because of the recent proliferation of radio frequency radiation from cell phones and towers, terrestrial antennas, Wi-Fi and Wi-max systems, broadband internet over power lines, and personal electronic equipment, we may be facing a looming epidemic of morbidity and mortality. In *Dirty Electricity*, he reveals the steps we must take, personally and as a society, to coexist with this marvelous but dangerous technology.

**Public Health SOS:
The Shadow Side of the Wireless Revolution**
Camilla Rees & Magda Havas

https://www.amazon.com/Public-Health-SOS-Wireless-Revolution/dp/1441458794/ref=sr_1_1?dchild=1&keywords=Public+Health+SOS&qid=1587047903&s=books&sr=1-1

Electromagnetic factors in health is an emerging public health issue globally, creating electrical sensitivity and being linked to illnesses of many kinds. Read this primer on EMF and health by Prof. Magda Havas of Canada and environmental activist and management consultant to change agents, Camilla Rees, founder of www.ElectromagneticHealth.org. Learn what the independent science shows, what you can do to create electromagnetic safety and how you can help get Congress to pay attention to this important issue affecting humans, animals and nature. This book resulted from 110 Questions asked of the audience at The Commonwealth Club of California in 2008, the nation's leading public affairs forum.

Authors: Camilla Rees is a health and environmental activist, management consultant and radio host on KGNU on the Green Economy. After a career in investment banking, venture capital and marketing communications, Ms. Rees now is dedicated to serving the transformation of health care so that it better meets patient needs and to raising awareness of hidden, unacknowledged drivers of health care costs. Dr. Magda Havas, PhD is Assoc. Professor of Environmental & Resource Studies at Trent University in Canada and an internationally recognized expert in the biological effects of environmental contaminants, including radiofrequency radiation, electromagnetic fields, dirty electricity and ground current.

The Body Electric: Electromagnetism And The Foundation Of Life

<https://www.amazon.com/Body-Electric-Electromagnetism-Foundation-Life/dp/0688069711>

Robert Becker

The Body Electric tells the story of our bioelectric selves. Robert O. Becker, a pioneer in the field of regeneration and its relationship to electrical currents in living things, challenges the established mechanistic understanding of the body. He found clues to the healing process in the long-discarded theory that electricity is vital to life. But as exciting as Becker's discoveries are, pointing to the day when human limbs, spinal cords, and organs may be regenerated after they have been damaged, equally fascinating is the story of Becker's struggle to do such original work. *The Body Electric* explores new pathways in our understanding of evolution, acupuncture, psychic phenomena, and healing.

2. Organizations

Antenna Search

<http://www.antennasearch.com>

Find out how many cellular/microwave towers & antennas are close to you

* * *

Cellular Phone Task Force

<https://www.cellphonetaskforce.org>

The Cellular Phone Task Force is dedicated to halting the expansion of wireless technology because it cannot be made safe. We provide:

- education to the public concerning electromagnetic pollution (electrosmog)
- advocacy for an electromagnetically cleaner environment
- support for individuals disabled by radiation from wireless technology and other sources.

* * *

5G Space Appeal

<https://www.5gspaceappeal.org>

On September 17, 2018 we launched an [International Appeal to Stop 5G on Earth and in Space](#). The Appeal, together with the list of signatories, will be formally presented to the United Nations, World Health Organization, European Union, and world governments when we have enough signatures.

5G is radically different from previous generations of wireless technology:

- Instead of being on private property relatively far from where people live and work, 5G antennas will be on the sidewalk in front of every third or fifth house

- Instead of emitting hundreds of watts of microwave radiation, each 5G antenna on the sidewalk will emit beams with an effective power as high as tens of thousands of watts of millimeter wave radiation
- Instead of nature being protected, 20,000 5G satellites in low orbit will irradiate every square inch of the Earth

Go to www.5gSpaceAppeal.org and add your signature to the thousands who have already signed.

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EMHO

Electro Magnetic Health Organization

<https://electromagnetichealth.org>

* * *

MAHB

Millennium Alliance for Humanity and the Biosphere

<https://mahb.stanford.edu/welcome/>

The goal of the Millennium Alliance for Humanity and the Biosphere (MAHB) is to create a platform to help global civil society address the interconnections among the greatest threats to human well-being: climate disruption, loss of biodiversity (and thus ecosystem services), land-use change and resulting degradation, global toxification, ocean acidification, decay of the epidemiological environment, an economic system based on growth, pressure from increasing population, and resource wars (which could go nuclear). The manifestation of these interactions is often referred to as “the human predicament.”

The MAHB Mission

Foster, fuel and inspire a global dialogue on how interconnected biogeophysical and socio-economic systems contribute to, and are affected by, the existential threats facing humanity and, the threat of collapse as a result of the manifestations of the human predicament

Develop and implement strategies for shifting human cultures and institutions towards practices that promote a future in which people can live peaceful and productive lives.

The MAHB offers six unique tools to civil society concerned with the major threats to humanity:

1. An *Alliance* of individuals and organizations concerned about the existential threats to civilization.
2. Vision of a world moving rapidly towards sustainability in 2050. The snapshot of the future is being designed to inspire and unite the diverse MAHB membership; it will provide a shared purpose that is exciting and inspiring—working towards core goals rather than against current injustice and destructive behaviors.
3. Scholars working across disciplines to build the knowledge that is necessary for civil society and governments to act in ways that will have the highest positive impact quickly.
4. Resources: The MAHB website aspires to become the “go to” place for the best literature, multi-media materials, analysis, movies, and editorials on the interconnected issues threatening humanity and its life support systems.
5. Activities: The MAHB website catalogs and makes available ideas for high impact action for those Nodes and Associates seeking additional ideas. Nodes and Associates post their activities, accomplishments, and strategies for shifting human behavior in ways that support a sustainable and equitable future.
6. Urgency: If we are to reverse the degradation of the systems that support civilization, we need to act now. The MAHB aspires to make available the tools necessary for fostering a contagion, a passion for action.

* * *

GUARDS

(Global Union Against Radiation Deployment From Space)

<http://www.stopglobalwifi.org>

Planned Global WiFi from Space Will Destroy Ozone Layer, Worsen Climate Change, and Threaten Life on Earth

info@stopglobalwifi.org

Thirteen companies are competing to cover the entire Earth with high-speed wireless Internet from low-orbit satellites within one to two years. This would be

an [ecological](#) and [public health nightmare](#). The biggest players are SpaceX (12,000 satellites), OneWeb (4,560 satellites) and Boeing (2,956 satellites).

The recent finding, in 2018, that stratospheric ozone is still declining despite the Montreal Protocol took everyone by surprise. The increasing pace of ever-more-powerful rocket launches is a likely factor. Imminent plans for beaming high-speed Internet from space would require the launching of large rockets almost daily. This is expected to alter, if not destroy, the ozone layer and contribute significantly to [climate change](#). Although many new rockets burn liquid fuel containing no ozone-destroying chlorine, the assumption that this is environmentally friendly is proving wrong.

Martin Ross and colleagues at the Aerospace Corporation have been sounding the alarm. Their 2009 paper, "[Limits on the Space Launch Market Related to Stratospheric Ozone Depletion](#)," pointed out that although liquid fuels do not contain chlorine, they produce significant amounts of nitrogen and hydrogen oxides, as well as water vapor and soot, when burned. All of those destroy ozone.

Martin Ross of the Aerospace Corporation was also the lead author of a paper published in 2010 titled "[Potential climate impact of black carbon emitted by rockets](#)." The authors developed a computer model to predict what would happen in different parts of the planet if the number of launches burning kerosene (then 25 annually) increased by a factor of ten. His model predicts as much as a 4% loss of ozone over the tropics and subtropics, as much as a 3-degree Celsius summertime increase in temperature over the South Pole, more than a one-degree overall increase in Antarctic temperature, and a decrease in Antarctic sea ice by 5% or more.

In a 2011 Aerospace article titled "[Rocket Soot Emissions and Climate Change](#)", Ross states "The Aerospace study shows that the radiative forcing of soot from a given hydrocarbon rocket scenario is as much as 100,000 times that of the carbon dioxide from the rockets." Obviously, the soot or black carbon emissions would be an important factor in accelerating climate change if the planned launches move forward.

Solid state rocket exhaust is no better. It contains ozone-destroying chlorine, water vapor (a greenhouse gas), and aluminum oxide particles, which seed stratospheric clouds. Complete ozone destruction is observed in the exhaust plumes of solid state rockets.

The New York Times ([May 14, 1991, p. 4](#)) quoted Aleksandr Dunayev of the Russian Space Agency saying "About 300 launches of the [space] shuttle each year would be a catastrophe and the ozone layer would be completely destroyed."

At that time, the world averaged only 12 rocket launches per year. Maintaining a fleet of (ultimately) 4,000 satellites, each with an expected lifespan of five years, will likely involve enough yearly rocket launches to be an environmental catastrophe.

Project Loon utilizes a scarce resource - helium - with reckless abandon. Helium is key to the function and manufacture of many technologies. Helium also has important scientific and hospital uses. It is a scarce fossil resource (<http://phys.org/news/2010-08-world-helium-nobel-prize-winner.html>) and should be conserved, not squandered. The balloons used by Project Loon are inflated with helium which is released into the atmosphere when the balloons are grounded. Furthermore, the balloons are made of polyethylene plastic which is not biodegradable, yet the balloons are only expected to have a life-span of 10 months. Our best estimate is that it would take 100,000 balloons to provide wireless to landmasses worldwide. This a lot of polyethylene to discard and a lot of helium to waste.

Contrary to popular perception, wireless technology is not a sustainable or environmentally friendly technology because wireless connectivity uses far more energy than wired connectivity. According to *Energy Consumption in Wired and Wireless Access Networks*, "**Wireless technologies will continue to consume at least 10 times more power than wired technologies** when providing comparable access rates and traffic volumes. PON [passive optical networks] will continue to be the most energy-efficient access technology." (<http://people.eng.unimelb.edu.au/rtucker/publications/files/energy-wired-wireless.pdf>), even as technology becomes more energy efficient. A higher amount of energy is consumed in transmitting large amounts of information through the air (a medium that has high resistance and high level of signal absorption) compared to transmission via various corded communication connections (e.g., copper or fiber optic based). In fact, in a paper looking at the energy consumption of cloud computing, the authors state, "**Our energy calculations show that by 2015, wireless cloud will consume up to 43 TWh**, compared to only 9.2 TWh in 2012, an increase of 460%. This is an increase in carbon footprint from 6 megatonnes of CO₂ in 2012 to up to 30 megatonnes of CO₂ in 2015, **the equivalent of adding 4.9 million cars to the roads. Up to 90% of this consumption is attributable to wireless access network technologies**, data centres account for only 9%."

(<http://www.ceet.unimelb.edu.au/publications/ceet-white-paper-wireless-cloud.pdf>)

While the article discusses cloud computing as though it is an energy saver, it is clear from the discussion that those energy savings are only realized if the cloud replaces individual computing power. Otherwise, cloud computing only causes additional energy consumption and should not be promoted as an environmentally-friendly technology. The energy wastefulness of wireless technology should cause national and international governments everywhere serious pause in their promotion of wireless technology.

A second area of concern is wireless itself. Although widely perceived as an unqualified good, wireless operates using extremely rapid pulses of microwave radiation - the same radiation used in microwave ovens. And a parade of studies continue to be published and ignored [implicating wireless technology](#) in the die-off of forests, the demise of frogs, bats, and honey bees, the threatened extinction of the house sparrow, and damage to the DNA of the human species. It is vital to the continuation of life that large parts of the earth be spared from the incessant radiation that accompanies wireless technologies.

"The human body", says Dr Gerard J. Hyland, of the University of Warwick, UK, "is an electrochemical instrument of exquisite sensitivity", noting that, like a radio, it can be interfered with by incoming radiation. If a signal can operate a mechanical device, it can disturb every cell in the human body.

On February 7, 2014, the [U.S. Department of Interior](#) stated that "the electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today" in reference to guidelines governing WiFi radiation frequencies.

In 2011 the World Health Organization classified radiation emitted by cell phones, and other wireless commercial infrastructure such as WiFi and smart meters as a [Class 2B possible human carcinogen](#), along with lead, engine exhaust, and DDT. Yet, the global WiFi projects would make this exposure ubiquitous and inescapable.

[A recent letter sent by 88 organizations](#), representing over a million people, to the European Economic and Social Committee outlines how governments are betraying the public trust by ignoring the hazards of radio frequency/microwave (RF/MW) radiation.

Studies show wireless radiation can adversely affect [fetal brain development](#), in addition to causing [double-stranded DNA breaks and causing a wide spectrum of illnesses](#). GUARDS believes that continuing and expanding involuntary exposure of the public to this known toxin violates the Nuremberg Code of Human Rights for non-consensual experimentation.

Satellite Deployment Plans

The eight companies seeking to provide global WiFi radiation include:

- SpaceX: 12,000 satellites, 1,200 km and 340 km high <http://www.spacex.com/>
- OneWeb: 2,000 satellites at 1,200 km and 2560 satellites at 8,500 km <http://www.oneweb.world> and <http://www.cnn.com/id/102340448>
- Boeing: 2,956 satellites, 1,000 km high
- Samsung: 4,600 satellites, 930 miles high <http://arxiv.org/ftp/arxiv/papers/1508/1508.02383.pdf>
- Google: Approximately 100,000 high altitude balloons (62,500 feet) to achieve global coverage ("Project Loon") <http://www.google.com/loon/>
- Telesat Canada: 117 satellites, multiple orbits <http://spacenews.com/telesat-prepares-shareholder-payday-outlines-117-satellite-constellation/>
- Theia Holdings: 120 satellites, low earth orbit <https://www.fiercewireless.com/wireless/from-boeing-to-spacex-11-companies-looking-to-shake-up-satellite-space>
- LeoSat MA: 108 satellites, low-earth orbit <http://leosat.com/>
- Iridium Next: 66 satellites, 483 miles high. An existing slow speed system. Launching of the "next generation" (higher speed) satellites is scheduled to begin in October 2015 and to be completed by 2017. <https://www.iridium.com/about/IridiumNEXT.aspx>
- Astrocast: 64 satellites for M2M/IoT <https://advanced-television.com/2017/12/15/swiss-else-to-build-64-satellites-for-m2m-iot/>
- O3b Networks: Has 16 satellites with aims to add more <https://www.ses.com/networks/>
- Kepler Communications: Planning satellites for a variety of wireless communication applications with polar orbits <http://www.keplercommunications.com/about>
- ViaSat: add 24 satellites, 8,200 km high <https://www.fiercewireless.com/wireless/viasat-expects-viasat-2-to-make-it-more-competitive-cellular-s-unlimited-offerings>

- Globalstar: 24 satellites, 880 miles high. Already in operation at slow data speeds. <http://www.globalstar.com/en/index.php?cid=8200>
- Karousel LLC: 4 satellites. <http://assets.fiercemarkets.net/public/007-Telecom/karousel.pdf>.
- Space Norway: 2 satellites. Deliver service to arctic region, including Alaska <https://www.fiercewireless.com/wireless/from-boeing-to-spacex-11-companies-looking-to-shake-up-satellite-space>.
- Audacy Corp.: Undetermined number of satellites at this time. <https://audacy.space/>.

3. Articles, Videos & Blogs

Missing the Forest for the Trees Re Covid-19?

<https://electromagnetichealth.org/electromagnetic-health-blog/missing-the-forest-for-the-trees/>

27.03.2020

Blog Post by Ronald Kostoff, PhD.

We are looking at the trees, and missing the forest, with respect to COVID-19. Let's focus on the quarantine. It is being implemented more widely in the USA, and in much of the world as well. Those affected most severely by SARS-CoV-2 typically develop pneumonia, and die from pneumonia. That's the official version, but it's far more nuanced and complicated. Some background, first.

I have developed protocols for preventing and reversing chronic diseases, and have applied them to three chronic diseases (CKD, AD, PN/PAD) [1]. The central step of the protocol is identifying the foundational contributing factors to the diseases (i.e., the causes), and eliminating those foundational causes. I use the qualifier 'foundational', since the causes I identify are not other diseases (which much of the medical community uses in part when talking about causes), but rather tangible items that are (in theory) under our control (e.g., smoking, excess alcohol, brominated flame retardants, heavy metals, pesticides, wireless radiation, etc).

For the three chronic diseases I have examined, I have identified anywhere from 500-1000 foundational causes each. Many of these foundational causes (such as those listed above) are pervasive, meaning that they impact multiple diseases. I would expect that pneumonia (the fatal consequence of the present [and SARS-CoV] coronavirus infection) would also have hundreds of foundational causes as well. This is a key point of my argument.

I also studied the SARS coronavirus pandemic of 2002-2003, and published a couple of papers on the topic [2,3]. My key takeaway from those studies was that there were three types of consequences for the people who were exposed to the SARS coronavirus (SARS-CoV). One group exhibited no symptoms, and the only measure of exposure was SARS coronavirus antibodies in their blood (tested for

other reasons). The second group exhibited symptoms characteristic of respiratory infections, and recovered after some level of discomfort. There were about 8,000 people globally who exhibited these symptoms, and went for medical care. The third group mainly developed pneumonia, and died from the pneumonia. There were about 800 people globally in this latter group. However, this latter group was not a random selection of the 8,000. Its members had high co-morbidity, weakened immune systems, and tended to be heavily populated by the elderly.

Co-morbidity in common usage is typically used to mean other diseases. From my perspective, each of these diseases is a proxy for the hundreds of foundational factors that contribute to its development. Thus, if we switch co-ordinate systems from diseases to foundational contributing factors, we could then state the third group that succumbed to SARS had high numbers of foundational contributing factors to disease. This is the key point.

In the current COVID-19 pandemic, we see some commonalities with what happened in the SARS pandemic. Most of the deaths in both cases resulted from pneumonia. Most of the deaths are among the elderly and appear to be most prevalent among those with high co-morbidities and weakened immune systems. Switching co-ordinate systems in our description, most of the fatalities are among those exposed (over their lifetime, as well as currently) to large numbers of contributing factors to disease.

In general, the public is being exposed to a mixture of toxic stimuli, and it is the effect of the mixture that is driving the myriad consequences. Different people will be exposed to different mixtures, and, based on the composition of the mixtures and a person's genetic makeup, will respond differently. There can be substantial synergies among the mixture constituents, resulting in enhanced adverse effects from the combination [4, 5]. The key concept here is that the mixture is determining the outcome, not necessarily any one of its constituents in isolation.

Now we get to the quarantine. The response of the governments worldwide (including the USA) to COVID-19 has been to restrict exposure to one of the many constituents of the toxic stimuli mixture, SARS-CoV-2. This is one of the few constituents of the mixture that cannot be ascribed to a technology offshoot, or to a technology that has corporate backing (like pesticides, industrial chemical, radiation sources, etc). The present quarantine eliminates only one of the many

constituents of the mixture, and it is the component that does not have strong corporate/lobbying backing!

Why are not any of the other constituents of the mixture being placed under quarantine? Why is not smoking, or air pollution, or excess alcohol, or wireless radiation, or agrochemicals, or industrial chemicals, being placed under quarantine? The fatalities supposedly from SARS-CoV-2 have resulted in limited mortalities globally so far, relative to those typically ascribed to the influenza flu virus. The fatalities that can be ascribed to some (perhaps most) other constituents of the mixture are far greater globally, when all their adverse effects are integrated. It is clear from the SARS results (and probably the present COVID-19 results) that exposure to the coronavirus (for the most part) results in no outward symptoms or mild symptoms, in the absence of large numbers of other toxic stimuli. It's not clear the same statement could be made about many of the other components of the toxic stimuli mixture that are spinoffs of modern technology.

The point is we have bought into the mindset and propaganda of the developers and vendors of these other toxic stimuli that the one constituent of the mixture without a strong lobbying group is the dangerous constituent, and the required approach for protection is quarantine from that one constituent. I would argue that the more protective quarantine, for the current pandemic and against future pandemics, would be to impose quarantines against the intrinsically toxic constituents of the mixture. Whether they would have the same very-short-term benefits as the coronavirus quarantine is questionable, but from the long-term perspective, the broader quarantine would be very protective against future viral attacks, including the annual influenza infections.

Sometimes analogies can be instructive. Consider the following. We have this big house in the desert, and we have neglected the roof for thirty years. Ten large holes have opened up on the roof, and we have delayed their repair. One day, an unexpected massive rainstorm arrives. Water comes pouring through the holes in the roof. We send out an emergency request for help. First responders, neighbors, etc, come to our aid and spend the day with buckets and pumps bailing out the water. They leave, we have survived, but we then do absolutely nothing to repair the holes in the roof. Three years later, another rainstorm, another panic response. Was the rain the cause; was it the holes in the roof; was it both? Would we have worried about the rain if there were no holes in the roof?

It is obvious from this analogy that, to be fully protective, we need both tactical reactive responses to survive the immediate threat and strategic proactive responses to prevent the problem and damage from re-occurring. Toward that end, I have recently published a document on identifying tactical and strategic treatments for COVID-19 [6]. It is Open Access.

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Access at: <https://smartech.gatech.edu/handle/1853/62523>

OR

<http://hdl.handle.net/1853/62523>
(Click link or enter into browser)

BIO

Ronald Neil Kostoff received a Ph. D. in Aerospace and Mechanical Sciences from Princeton University in 1967. He has worked for Bell Laboratories, Department of Energy, Office of Naval Research, and MITRE Corp. He invented the Wake Shield for producing high vacuum in low orbit, and used in manned space missions for research and development. He has published over 200 peer-reviewed articles, served as Guest Editor of four journal Special Issues since 1994, obtained two text mining system patents, and presently is a Research Affiliate at Georgia Institute of Technology.

Environment, 5G Technology and LED lighting Unintended Consequences

https://mahb.stanford.edu/library-item/environment-5g-technology-and-led-lighting-unintended-consequences/?fbclid=IwAR0LG8jk6ZS9jlwoBEhu0p0n7IXd1ngwrJCE2utCBVwLqchqZ_KnaC1-UYM

April 14, 2020

MAHB Administration

The decision by the UK Government to invite Chinese tech company Huawei to develop a significant sector of the UK's telecoms network has raised national security concerns in the UK and the United States. This is just one of many concerns surrounding the technology we are failing to discuss adequately.

The obsessive drive by tech giants to develop artificial intelligence envisages every facet of our lives dominated by 5G networks. The media is pumping up this technology love-in with an IT sector that paints visions of driverless vehicles they claim are safer and more efficient than human-controlled transport, offers ultra-fast streaming to mobile cell phones, tech fantasies, with central management of domestic devices and even drone delivery of online orders to homes, to shatter what peace we have left in an overcrowded world.

Advocates point to areas where the technology might assist, perhaps in surgical procedures, but there is no sound evidence that autonomous vehicles are reducing collisions or injuries. An article in [The Guardian on October 3, 2019](#), quotes a 2018 US study that says driverless systems would have to improve ten-fold in detecting pedestrians, compared with humans.

As data from billions of internet-connected 'smart' devices grows exponentially, it is estimated that the IT industry could consume [20% of all the world's electricity by 2025](#), straining power grids to feed an incessant demand from people hooked on message sharing and phone screen entertainment.

We are rapidly moving into a 5G communications world, where bandwidths used currently by cell phones are becoming saturated by a growing social phenomenon of phone screen addiction. The Internet of Things promises to give us more. But more of what?

According to Fortune.com 5G will support at least 100 billion devices and will be 10 to 100 times faster than current 4G technology. (4G was already about 10 times

faster than 3G). It offers near infinite data broadcast by using largely untapped bandwidth of the millimeter (MMW) wave.

Wireless Cell Antennas Galore

Millimeter waves do not travel well through buildings and they tend to be absorbed by rain and plants, interfering with the signal. They also have much shorter wavelengths that can't travel far. To counter this problem 5G will utilize smaller cell stations. This could mean wireless antennas on lamp posts, utility poles and buildings throughout entire neighborhoods, towns, and cities. These towers will probably be about 4 feet tall as opposed to the usual 90 feet towers currently erected around us. Cells will be available within a 100-meter range.

5G also risks causing more tree culling. The 5G Innovation Centre in Surrey says that “where trees are comparable heights to masts, coverage can be reduced by as much as 70%.”

Extreme solar flares could crash global systems connected with electricity and electronics. Astronomical observations, including asteroid collision monitoring, will be greatly harmed by plans to deploy up to 50,000 small satellites in preparation for 5G telecoms, alongside replacing thousands of satellites every year, disintegrating them in the lower atmosphere.

Impact on Human Health and our Environment

Testing is rampant by companies who are interested to tap into the lucrative possibilities of 5G. But few are willing to research its effects on health. The International Commission on Non-Ionizing Radiation Protection guidelines remain essentially unchanged since 1998, not recognizing radiofrequency microwave radiation as harmful unless there is a heating effect.

In [2016 The Global Union Against Radiation Deployment from Space](#) (GUARD) wrote to US officials about the potential harm 5G will inflict.

Trevor Marshall, Director of the Autoimmunity Research Foundation California, says: “5G wireless technology involves extremely high frequencies producing photons of much greater energy than 4G and WiFi. Allowing this technology to be used without proving its safety is reckless in the extreme, as the waves are known to have a profound effect on the human body.” Olga Sheean, author of “No Safe Place” warns that: “The plans to beam highly penetrative 5G milliwave radiation at

us from space must surely be one of the greatest follies ever conceived by mankind. There will be nowhere safe to live.”

Reasons for Concern

[Many studies](#) link wireless radiofrequency radiation exposure to adverse biological effects:

1. Effects on the skin – Dr. Ben-Ishai of Hebrew University, Israel said: “our sweat ducts act like “an array of helical antennas when exposed to these wavelengths,” meaning that we become more conductive.” Another study found that 90% of the transmitted power is absorbed in the skin.
2. Effects on cell growth and bacteria resistance – [A 2016 Armenian study](#) suggests that microwave effects impact water, cell plasma membrane and genome activity, altering sensitivity to “different biologically active chemicals, including antibiotics.”
3. Effects on plant health – MMW is particularly susceptible to being absorbed by plants and rain. Humans and animals consume plants as a food source. [The rain that falls on these plants will also be irradiated.](#)
4. Atmospheric effects and increased use of fossil fuels – Implementation of the 5G network requires launching rockets to deploy satellites for 5G. These satellites have a short lifespan requiring a lot more deployment. A new type of hydrocarbon rocket engine expected to power a fleet of suborbital rockets would emit black carbon which “could cause potentially significant changes in the global atmospheric circulation” according to a [2010 Californian study](#).
5. Disruption of natural ecosystems – Since the year 2000, there are reports of birds abandoning nests, locomotion problems, and reduced survival, says biologist [Alfonso Balmori](#). Declining bee populations are also believed to be linked to EMF radiation.

Energy-saving LED Lighting

Alongside this, more efficient LED street lighting is being rolled out by governments, as LEDs are far more energy-efficient. Surely this is all good news?

The U.S. Department of Energy says LED lights use at least 75 percent less energy while lasting 25 times longer than incandescent lighting. It estimates that widespread LED use in the U.S. by 2027 could save the equivalent electrical output of 44 large electric power plants each year, amounting to at least \$30 billion in savings. Unfortunately, most authorities are opting for LEDs that typically have excessive blue frequencies rather than the less intense ‘warm’ LED lights – without consulting local people on the options and consequences.

American Medical Association: LED light pollution poses environmental risks
In 2016 the American Medical Association (AMA) issued new guidance on [how to reduce the harmful effects of high-intensity LEDs](#), recognizing the importance of using the lower emission light with shielding to minimize glare. Are any local authorities listening? Some communities, like Davis, California, have successfully challenged councils to replace bulb units with ‘warm’ LEDs. The Smart Outdoor Lighting Alliance (SOLA) promotes ecologically responsible lighting.

Resources:

For more information on 5G issues visit:

<https://www.stop5ginternational.org>

<https://www.electricsense.com/12399/5g-radiation-dangers/>

<https://www.hindawi.com/journals/ijfr/2010/836278/>

https://en.wikipedia.org/wiki/Arthur_Firstenberg

<http://parentsforsafetechnology.org/>

* * *

YouTube Interview With Arthur Firstenberg
The Hidden Dangers of Wireless & Cell Phone Radiation
1/29/19

Part 1: <https://www.youtube.com/watch?v=rh0dp...>

Part 2: <https://www.youtube.com/watch?v=yqxQZ...>

Part 3: <https://www.youtube.com/watch?v=yYW3j...>

Part 4: <https://www.youtube.com/watch?v=MRsy3...>

Wi-Fi In The Sky

<https://www.cellphonetaskforce.org>

“Just a little rain falling all around
The grass lifts its head to the heavenly sound
Just a little rain, just a little rain
What have they done to the rain?”

Malvina Reynolds

On September 23, 1998, 66 satellites, launched into low orbit by the Iridium Corporation, commenced broadcasting to the first ever satellite telephones. Those phones would work equally as well in mid-ocean, and in Antarctica, as in the middle of Los Angeles—a remarkable achievement.

But telephone interviews revealed that on that day exactly, electrically sensitive people all over the world experienced stabbing pains in their chest, knife-like sensations in their head, nosebleeds, asthma attacks, and other signs of severe electrical illness. Many did not think they were going to make it. Statistics published by the Centers for Disease Control reveal that the national death rate rose 4 to 5 percent during the following two weeks. Thousands of homing pigeons lost their way during those two weeks, all over the United States.

Several companies are now competing to provide not just cell phone service, but Wi-Fi and the equivalent of 5G, to every square inch of the earth from satellites in space in low earth orbit. Their target dates are 2019 or 2020. They are planning not 66 satellites, but tens of thousands of satellites. There isn't much time to prevent a global ecological catastrophe.

The companies with the biggest schemes include:

SpaceX: 12,000 satellites

OneWeb: 4560 satellites

Boeing: 2956 satellites

Spire Global: 972 satellites

Honeywell has already signed a memorandum of understanding to become OneWeb's first large customer—it plans to provide high-speed WiFi on business, commercial, and military aircraft throughout the world.

SpaceX would like to provide the equivalent of 5G to every person on the planet.

In addition to microwaving the Earth, these plans have the potential to destroy the Earth's ozone layer and add to global warming.

The New York Times (May 14, 1991, p. 4) quoted Aleksandr Dunayev of the Russian Space Agency saying “About 300 launches of the space shuttle each year would be a catastrophe and the ozone layer would be completely destroyed.”

At that time, the world averaged only 12 rocket launches per year. Maintaining a fleet of 12,000 satellites, such as SpaceX is proposing to do, each with an expected lifespan of 5 years, will likely involve enough yearly rocket launches to be an environmental catastrophe.

Elon Musk's SpaceX, and probably the other huge satellite schemes, would require the launch of hundreds of kerosene-burning rockets annually.

It is a misconception that liquid fuels, such as kerosene, are environmentally friendly and destroy no ozone. This was analyzed in 2009 by scientists at the Aerospace Corporation in a paper titled “[Limits on the Space Launch Market Related to Stratospheric Ozone Depletion](#).” They found that although liquid fuels do not contain chlorine, they still produce significant amounts of nitrogen and hydrogen oxides, as well as water vapor and soot when burned, all of which destroy ozone. “The assumption that liquid rocket engines are green as far as ozone is concerned is not correct,” they wrote. Even if liquid fuels optimistically destroyed only 2% as much ozone as solid fuels, a 50-fold increase in the rate of rocket launches, which is about to happen unless the world wakes up, would destroy just as much ozone. And the authors state that their 2% figure is little better than a guess because of “the nearly complete lack of data and models.”

Martin Ross of the Aerospace Corporation was also the lead author of a paper published in 2010 titled “[Potential climate impact of black carbon emitted by rockets](#).” The authors developed a computer model to predict what would happen in different parts of the planet if the number of launches burning kerosene (then 25 annually) increased by a factor of 10. Their model predicts as much as a 4% loss of ozone over the tropics and subtropics, as much as a 3-degree Celsius summertime increase in temperature over the South Pole, more than a 1-degree Celsius overall

increase in Antarctic temperature, and a decrease in Antarctic sea ice by 5% or more.

In a 2011 Aerospace article titled “[Rocket Soot Emissions and Climate Change](#),” Ross states “The Aerospace study shows that the radiative forcing of soot from a given hydrocarbon rocket scenario is as much as 100,000 times that of the carbon dioxide from the rockets.” Obviously, the soot or black carbon emissions would be an important factor in accelerating climate change if the planned launches move forward.

Solid state rocket exhaust is no better. It contains ozone-destroying chlorine, water vapor (a greenhouse gas), and aluminum oxide particles, which seed stratospheric clouds. Complete ozone destruction is observed in the exhaust plumes of solid state rockets.

[The recent finding](#), in 2018, that stratospheric ozone is still declining despite the Montreal Protocol took everyone by surprise. The unrestrained proliferation of ever-more-powerful rocket launches may be one factor, but nobody is paying attention.

An international coalition, [Global Union Against Radiation Deployment from Space](#) (GUARDS) has been formed.

* * *

Multerland

<https://multerland.wordpress.com>

Multerland is an educational blog from Norway about the hidden dangers of wireless, cell phone radiation and 5G, care for the earth, nature, natural health, spirituality, psychology, deep ecology, and wholism.

4. Scientists

Expressions of Concern from Scientists, Physicians, Health Policy Experts & Others

William Rea, MD

Founder & Director of the Environmental Health Center, Dallas

Past President, American Academy of Environmental Medicine

“Sensitivity to electromagnetic radiation is the emerging health problem of the 21st century. It is imperative health practitioners, governments, schools and parents learn more about it. The human health stakes are significant”.

Martin Blank, PhD

Associate Professor, Department of Physiology and Cellular Biophysics, Columbia University, College of Physicians and Surgeons; Researcher in Bioelectromagnetics; Author of the BioInitiative Report’s section on Stress Proteins.

“Cells in the body react to EMFs as potentially harmful, just like to other environmental toxins, including heavy metals and toxic chemicals. The DNA in living cells recognizes electromagnetic fields at very low levels of exposure; and produces a biochemical stress response. The scientific evidence tells us that our safety standards are inadequate, and that we must protect ourselves from exposure to EMF due to power lines, cell phones and the like, or risk the known consequences. The science is very strong and we should sit up and pay attention.”

Olle Johansson, Ph.D.

Associate Professor, The Experimental Dermatology Unit, Department of Neuroscience, Karolinska Institute, Stockholm, Sweden; Author of the BioInitiative Report’s section on the Immune System.

“It is evident that various biological alterations, including immune system modulation, are present in electrohypersensitive persons. There must be an end to the pervasive nonchalance, indifference and lack of heartfelt respect for the plight of these persons. It is clear something serious has happened and is happening. Every aspect of electrohypersensitive peoples’ lives, including the ability to work productively in society, have healthy relations and find safe, permanent housing, is

at stake. The basics of life are becoming increasingly inaccessible to a growing percentage of the world's population. I strongly advise all governments to take the issue of electromagnetic health hazards seriously and to take action while there is still time. There is too great a risk that the ever increasing RF-based communications technologies represent a real danger to humans, especially because of their exponential, ongoing and unchecked growth. Governments should act decisively to protect public health by changing the exposure standards to be biologically-based, communicating the results of the independent science on this topic and aggressively researching links with a multitude of associated medical conditions.”

David Carpenter, MD

Professor, Environmental Health Sciences, and Director, Institute for Health and the Environment, School of Public Health, University of Albany, SUNY

Co-Editor, The BioInitiative Report (www.BioInitiative.org)

Electromagnetic fields are packets of energy that does not have any mass, and visible light is what we know best. X-rays are also electromagnetic fields, but they are more energetic than visible light. Our concern is for those electromagnetic fields that are less energetic than visible light, including those that are associated with electricity and those used for communications and in microwave ovens. The fields associated with electricity are commonly called “extremely low frequency” fields (ELF), while those used in communication and microwave ovens are called “radiofrequency” (RF) fields. Studies of people have shown that both ELF and RF exposures result in an increased risk of cancer, and that this occurs at intensities that are too low to cause tissue heating. Unfortunately, all of our exposure standards are based on the false assumption that there are no hazardous effects at intensities that do not cause tissue heating. Based on the existing science, many public health experts believe it is possible we will face an epidemic of cancers in the future resulting from uncontrolled use of cell phones and increased population exposure to WiFi and other wireless devices. Thus it is important that all of us, and especially children, restrict our use of cell phones, limit exposure to background levels of Wi-Fi, and that government and industry discover ways in which to allow use of wireless devices without such elevated risk of serious disease. We need to educate decision-makers that ‘business as usual’ is unacceptable. The importance of this public health issue can not be underestimated.”

Magda Havas, PhD

Associate Professor, Environment & Resource Studies, Trent University, Canada.
Expert in radiofrequency radiation, electromagnetic fields, dirty electricity and ground current.

“Radio frequency radiation and other forms of electromagnetic pollution are harmful at orders of magnitude well below existing guidelines. Science is one of the tools society uses to decide health policy. In the case of telecommunications equipment, such as cell phones, wireless networks, cell phone antennas, PDAs, and portable phones, the science is being ignored. Current guidelines urgently need to be re-examined by government and reduced to reflect the state of the science. There is an emerging public health crisis at hand and time is of the essence.”

Whitney North Seymour, Jr., Esq.

Retired Attorney; Former New York State Senator & United States Attorney,
Southern District of NY

Co-Founder, Natural Resources Defense Council

“Electromagnetic radiation is a very serious human and environmental health issue that needs immediate attention by Congress. The BioInitiative Report is a major milestone in understanding the health risks from wireless technology. Every responsible elected official owes it to his or her constituents to learn and act on its finding and policy recommendations.”

B. Blake Levitt

Former New York Times journalist and author of *Electromagnetic Fields, A Consumer's Guide to the Issues and How to Protect Ourselves*, and *Editor of Cell Towers, Wireless Convenience? Or Environmental Hazard?*

Ambient man-made electromagnetic fields (EMFs), across a range of frequencies, are a serious environmental issue. Yet most environmentalists know little about it, perhaps because the subject has been the purview of physicists and engineers for so long that biologists have lost touch with electromagnetism's fundamental inclusion in the biological paradigm. All living cells and indeed whole living beings, no matter what genus or species, are dynamic coherent electrical systems utterly reliant on bioelectricity for life's most basic metabolic processes. It turns out that most living things are fantastically sensitive to vanishingly small EMF exposures. Living cells interpret such exposures as part of our normal cellular activities (think heartbeats, brainwaves, cell division itself, etc.) The problem is, man-made electromagnetic exposures aren't "normal." They are artificial artifacts, with unusual intensities, signaling characteristics, pulsing patterns, and wave forms, that

don't exist in nature. And they can misdirect cells in myriad ways. Every aspect of the ecosystem may be affected, including all living species from animals, humans, plants and even microorganisms in water and soil. We are already seeing problems in sentinel species like birds, bats, and bees. Wildlife is known to abandon areas when cell towers are placed. Radiofrequency radiation (RF)—the part of the electromagnetic spectrum used in all-things-wireless today—is a known immune system suppressor, among other things. RF is a form of energetic air pollution and we need to understand it as such. Humans are not the only species being affected. The health of our planet may be in jeopardy from this newest environmental concern—added to all the others. Citizens need to call upon government to fund appropriate research and to get industry influence out of the dialogue. We ignore this at our own peril now.”

Eric Braverman, MD

Brain researcher, Author of *The Edge Effect*, and Director of Path Medical in New York City and The PATH Foundation. Expert in the brain's global impact on illness and health.

“There is no question EMFs have a major effect on neurological functioning. They slow our brain waves and affect our long-term mental clarity. We should minimize exposures as much as possible to optimize neurotransmitter levels and prevent deterioration of health”.

Abraham R. Liboff, PhD

Research Professor

Center for Molecular Biology and Biotechnology

Florida Atlantic University, Boca Raton, Florida

Co-Editor, *Electromagnetic Biology and Medicine*

“The key point about electromagnetic pollution that the public has to realize is that it is not necessary that the intensity be large for a biological interaction to occur. There is now considerable evidence that extremely weak signals can have physiological consequences. These interactive intensities are about 1000 times smaller than the threshold values formerly estimated by otherwise knowledgeable theoreticians, who, in their vainglorious approach to science, rejected all evidence to the contrary as inconsistent with their magnificent calculations. These faulty estimated thresholds are yet to be corrected by both regulators and the media.

The overall problem with environmental electromagnetism is much deeper, not only of concern at power line frequencies, but also in the radiofrequency range encompassing mobile phones. Here the public's continuing exposure to

electromagnetic radiation is largely connected to money. Indeed the tens of billions of dollars in sales one finds in the cell phone industry makes it mandatory to corporate leaders that they deny, in knee-jerk fashion, any indication of hazard.

There may be hope for the future in knowing that weakly intense electromagnetic interactions can be used for good as well as harm. The fact that such fields are biologically effective also implies the likelihood of medical applications, something that is now taking place. As this happens, I think it will make us more aware about how our bodies react to electromagnetism, and it should become even clearer to everyone concerned that there is reason to be very, very careful about ambient electromagnetic fields.”

Lennart Hardell, MD, PhD

Professor at University Hospital, Orebro, Sweden.

World-renowned expert on cell phones, cordless phones, brain tumors, and the safety of wireless radiofrequency and microwave radiation.

Co-authored the BioInitiative Report's section on Brain Tumors by Dr. Hardell

“The evidence for risks from prolonged cell phone and cordless phone use is quite strong when you look at people who have used these devices for 10 years or longer, and when they are used mainly on one side of the head. Recent studies that do not report increased risk of brain tumors and acoustic neuromas have not looked at heavy users, use over ten years or longer, and do not look at the part of the brain which would reasonably have exposure to produce a tumor.”

Samuel Milham MD, MPH

Medical epidemiologist in occupational epidemiology.

First scientist to report increased leukemia and other cancers in electrical workers and to demonstrate that the childhood age peak in leukemia emerged in conjunction with the spread of residential electrification.

“Very recently, new research is suggesting that nearly all the human plagues which emerged in the twentieth century, like common acute lymphoblastic leukemia in children, female breast cancer, malignant melanoma and asthma, can be tied to some facet of our use of electricity. There is an urgent need for governments and individuals to take steps to minimize community and personal EMF exposures.”

Libby Kelley, MA

Managing Secretariat International Commission For Electromagnetic Safety;
Founder, Council on Wireless Technology Impacts; Co-Producer of documentary,
“Public Exposure: DNA, Democracy and the Wireless Revolution”; EMF

environmental consultant and leading appellant in challenging the FCC Radio Frequency Radiation human exposure guidelines, 1997-2000. (www.icems.eu)

“Radiofrequency radiation human exposure standards for personal wireless communications devices and for environmental exposure to wireless transmitters are set by national governments to guide the use of wireless communications devices and for wireless transmitters. In the U.S., the Food and Drug Administration and the Federal Communications Commission set these standards. The Council on Wireless Technology Impacts considers these exposure standards to be inadequate as they are based on heating effects and do not accommodate the low level, cumulative exposure conditions in which the public now lives. These standards are also designed for acute, short term exposure conditions and do not acknowledge the medical evidence pointing to increased risks and actual harm that results from chronic, intermittent exposure. Federal and State public health agencies are not officially addressing what many concerned scientists and medical doctors now see as an emerging public health problem. There are no health surveillance or remedial response systems in place to advise citizens about electromagnetic radiation exposure (EMR). As wireless technology evolves, ambient background levels increase, creating electrical pollution conditions which are becoming ubiquitous and more invasive. We strongly encourage consumers, manufacturers, utility providers and policymakers to reduce, eliminate and mitigate EMR exposure conditions and to support biologically based standards.”

James S. Turner, Esq.

Chairman of the Board, Citizens for Health

Co-author, *Voice of the People: The Transpartisan Imperative in American Life*

Attorney, Swankin-Turner, Washington, DC

“According to the BioInitiative Report: A Rationale for a Biologically-Based Public Exposure Standard for Electromagnetic Fields—from electrical and electronic appliances, power lines and wireless devices such as cell phones, cordless phones, cellular antennas, towers, and broadcast transmission towers—we live in an invisible fog of EMF which thirty years of science, including over 2,000 peer reviewed studies, shows exposes us to serious health risks such as increased Alzheimer’s disease, breast cancer, Lou Gehrig disease, EMF immune system hypersensitivity and disruption of brain function and DNA. The public needs to wake up politicians and public officials to the need for updating the decades old EMF public health standards. This report tells how.”

Camilla Rees, MBA
CEO, Wide Angle Health, LLC
Patient education and advocacy

“The U.S. spends over \$2 trillion dollars on health care each year, of which about 78% is from people with chronic illnesses, without adequately exploring and understanding what factors—including EMF/RF—contribute to imbalances in peoples’ bodies’ in the first place. After reading The BioInitiative Report, it should come as no surprise to policymakers, given the continually increasing levels of EMF/RF exposures in our environment, that close to 50% of Americans now live with a chronic illness. I grieve for people who needlessly suffer these illnesses and hold out the hope that our government leaders will become more cognizant of the role electromagnetic factors are playing in disease, health care costs and the erosion of quality of life and productivity in America.”

L. Lloyd Morgan, BS Electronic Engineering
Director Central Brain Tumor Registry of the United States, Member Bioelectromagnetics Society, Member Brain Tumor Epidemiological Consortium *
“There is every indication that cell phones cause brain tumors, salivary gland tumors and eye cancer. Yet, because the cell phone industry provides a substantial proportion of research funding, this reality is hidden from the general public. The Interphone Study, a 13-country research project, substantially funded by the cell phone industry has consistently shown that use of a cell phone protects the user from risk of a brain tumor! Does anything more need to be said? It is time that fully independent studies be funded by those governmental agencies whose charter is to protect its citizens so that the truth about the very damaging health hazards of microwave radiation becomes clear and well known.”

Janet Newton
President, The EMR Policy Institute
www.EMRPolicy.org

“The radiofrequency radiation safety policy in force in the United States fails to protect the public. Currently in the US there are more than 260 million wireless subscribers, the demand that drives the continuing build-out of antenna sites in residential and commercial neighborhoods, including near schools, daycare centers, and senior living centers and in the workplace. The January 2008 report issued by the National Academy of Sciences committee whose task was to examine the needs and gaps in the research on the biological effects of exposure to these antennas points out that the research studies to date do not adequately

represent exposure realities. Specifically, the studies 1) assume a single antenna rather than the typical arrangements of a minimum of four to six antennas per site, thereby underestimating exposure intensities, 2) do not pertain to the commonly used multiple-element base station antennas, thereby not taking into account exposures to multiple frequencies, 3) lack models of several heights for men, women, and children of various ages for use in the characterization of Specific Absorption Rate (SAR) distributions for exposures from cell phones, wireless PCs, and base stations and 4) do not take into consideration absorption effects of exposures from the many different radio frequency emitting devices to which the public is often simultaneously exposed. A federal research strategy to address these very serious inadequacies in the science on which our government is basing health policy is sorely needed now.”

Prof. Livio Giuliani, PhD

Spokesperson, International Commission for Electromagnetic Safety
(www.icems.eu)

Deputy Director, Italian National Institute for Worker Protection and Safety, East Venice and South Tyrol; Professor, School of Biochemistry of Camerino University, Italy

The Venice Resolution, initiated by the International Commission for Electromagnetic Safety (ICEMS) on June 6, 2008, and now signed by nearly 50 peer reviewed scientists worldwide, states in part, “We are compelled to confirm the existence of non-thermal effects of electromagnetic fields on living matter, which seem to occur at every level of investigation from molecular to epidemiological. Recent epidemiological evidence is stronger than before. We recognize the growing public health problem known as electrohypersensitivity. We strongly advise limited use of cell phones, and other similar devices, by young children and teenagers, and we call upon governments to apply the Precautionary Principle as an interim measure while more biologically relevant exposure standards are developed.”

Professor Jacqueline McGlade

Executive Director, European Environmental Agency

Advisor to European Union countries under the European Commission

“There are many examples of the failure to use the precautionary principle in the past, which have resulted in serious and often irreversible damage to health and environments. Appropriate, precautionary and proportionate actions taken now to avoid plausible and potentially serious threats to health from EMF are likely to be seen as prudent and wise from future perspectives.”

Paul J. Rosch, MD

Clinical Professor of Medicine and Psychiatry, New York Medical College; Honorary Vice President International Stress Management Association; Diplomat, National Board of Medical Examiners; Full Member, Russian Academy of Medical Sciences; Fellow, The Royal Society of Medicine; Emeritus Member, The Bioelectromagnetics Society

Claims that cell phones pose no health hazards are supported solely by Specific Absorption Rate (SAR) limits safety standards written by the telecommunications industry decades ago based on studies they funded. These have made the erroneous assumption that the only harm that could come from cell phone radiofrequency emissions would be from a thermal or heating action, since such non thermal fields can have no biological effects. The late Dr. Ross Adey disproved this three decades ago by demonstrating that very similar radiofrequency fields with certain carrier and modulation frequencies that had insufficient energy to produce any heating could cause the release of calcium ions from cells. Since then, numerous research reports have confirmed that non thermal fields from cell phones, tower transmitters, power lines, and other man made sources can significantly affect various tissues and physiologic functions.

We are constantly being bathed in an increasing sea of radiation from exposure to the above, as well as electrical appliances, computers, Bluetooth devices, Wi-Fi installations and over 2,000 communications satellites in outer space that shower us with signals to GPS receivers. New WiMax transmitters on cell phone towers that have a range of up to two square miles compared to Wi-Fi's 300 feet will soon turn the core of North America into one huge electromagnetic hot spot. Children are more severely affected because their brains are developing and their skulls are thinner. A two-minute call can alter brain function in a child for an hour, which is why other countries ban their sale or discourage their use under the age of 18. In contrast, this is the segment of the population now being targeted here in a \$2 billion U.S. advertising campaign that views "tweens" (children between 8 and 12 years old) as the next big cell phone market. Firefly and Barbie cell phones are also being promoted for 6 to 8-year-olds.

It is not generally appreciated that there is a cumulative effect and that talking on a cell phone for just an hour a day for ten years can add up to 10,000 watts of radiation. That's ten times more than from putting your head in a microwave oven. Pregnant women may also be at increased risk based on a study showing that children born to mothers who used a cell phone just two or three times a day

during pregnancy showed a dramatic increase in hyperactivity and other behavioral and emotional problems. And for the 30% of children who had also used a cell phone by age 7, the incidence of behavioral problems was 80% higher! Whether ontogeny (embryonic development) recapitulates phylogeny is debatable, but it is clear that lower forms of life are also much more sensitive. If you put the positive electrode of a 1.5 volt battery in the Pacific Ocean at San Francisco and the negative one off San Diego, sharks in the in between these cities can detect the few billionths of a volt electrical field. EMF fields have also been implicated in the recent massive but mysterious disappearance of honeybee colonies essential for pollinating over 90 commercial crops. As Albert Einstein warned, “If the bee disappeared off the surface of the globe, then man would only have four years of life left.”

Finally, all life on earth evolved under the influence of solar radiation and geomagnetic forces that we have learned to adapt to and in some instances even utilize. The health of all living systems (ranging upward from a cell, tissue, organ or person, to a family, organization or nation) depends on good communication – good communication within, as well as with the external environment. All communication in the body eventually takes place via very subtle electromagnetic signaling between cells that is now being disrupted by artificial electropollution we have not had time to adapt to. As Alvin Toffler emphasized in *Future Shock*, too much change in too short a time produces severe stress due to adaptational failure. The adverse effects of electrosmog may take decades to be appreciated, although some, like carcinogenicity, are already starting to surface. This gigantic experiment on our children and grandchildren could result in massive damage to mind and body with the potential to produce a disaster of unprecedented proportions, unless proper precautions are immediately implemented. At the same time, we must acknowledge that novel electromagnetic therapies have been shown to benefit stress related disorders ranging from anxiety, depression and insomnia, to arthritis, migraine and tension headaches. As demonstrated in *Bioelectromagnetic Medicine*, they may also be much safer and more effective than drugs, so we need to avoid throwing the baby out with the bathwater.”