

CALL TO ORDER

Mayor Casale called the meeting to order at 7:00 PM

PLEDGE OF ALLEGIANCE

Mayor Casale led the Pledge of Allegiance

A moment of silence was observed for those who serve and have served in the United States military

ROLL CALL

Present:

Councilmembers George Mansfield, At Large (GM); Terry Nelson, Ward One (TN); John Rembert, Ward Two (JR); Jodi McCredo, Ward Three (JM); Amber Grant, Ward Four (AG); and Mayor Randy Casale (RC) Total: 6, **quorum present**

Not present:

Lee Kyriacou, At Large (LK) - excused

Also Present:

City Administrator Anthony Ruggiero (AR); City Attorney Nick Ward-Willis (NWW)

1ST OPPORTUNITY FOR PUBLIC COMMENT

Speakers:

- Dennis Pavelock spoke about the annual fireworks
- April Farley invited the Council to the next meeting of the Southern Dutchess NAACP; spoke about Juneteenth, "Keep the Families Together Act" and the MTA tunnel
- Stosh Yankowski spoke about the recently passed CMS local law and 4 story buildings
- Justin Skinner spoke about the negative effects prepared food vendors at the Farmer's Market have on his business
- Jason Hughes spoke about the City's action against him and related attorney fees
- Sharon Watts spoke about brush dumping on a vacant lot next to hers
- Theresa Kraft spoke about Beacon's rate of development
- Justin Fowler spoke about food vendors at the Beacon Farmer's Market

PUBLIC PRESENTATIONS

- ACE program Dutchess County

PUBLIC HEARINGS**1. Public Hearing on a proposed local law to create Section 223-26.4 of the Code of the City of Beacon, concerning Small Cell Wireless Facilities**

Speakers:

- Scott Olsen, attorney for Verizon, thanked NWW for working with him. Explained that he and Verizon feel the draft law as written is discriminatory and that the fees are excessive.
- Stosh Yankowski spoke about his critique of the draft local law, concerns related to small cell technology and the aesthetics of the equipment. Offered a photo (attached) to the Council showing small cell wireless equipment on poles in Newburgh.
- Hope Turino spoke about the health risks of 5G technology.
- Theresa Kraft spoke against the placement and installation of cell towers.

⇒ A motion was made by GM, seconded by JR to adjourn the public hearing on Small Cell Facilities to July 16, 2018. The motion was carried unanimously by voice vote.

2. Public Hearing on proposed local law to amend Chapter 195 of the Code of the City of Beacon, concerning Lot Line Adjustments

Speakers:

- Paul Supple, real estate transactional attorney spoke on behalf of his client David Smolen who owns an existing non-conforming lot.
- Noelle Foster asked for consideration for existing non-conforming lots.
- Theresa Kraft expressed concern for the encouragement of subdivisions and overdevelopment.

⇒ A **motion was made** by JM, seconded by AG **to adjourn** the public hearing on Lot Line Adjustments to July 2, 2018. The **motion was carried** unanimously by voice vote.

REPORTS

Council

- AG – Would like a review of the property with the dead trees Sharon Watts spoke about. Requested historical consultant for the Tioronda Bridge and reminded everyone of the Community Choice Aggregation (CCA) informational meeting being held at the Howland Public Library on 6/24 from 1-3 PM.
- JR – Reported getting noise complaints from constituents and asked about City noise ordinances
- GM – no report
- JM – Requested public send concerns or issues to her via email so she can respond directly. Shared that there are cooling centers available in Cold Spring at the American Legion, Philipstown and Blodgett Library in Fishkill.
- TN – Residents of Monnell complaining of increased noise from the bridge. Received complaints of speeding on West Church Street and requested the Traffic Safety Committee discuss this at their next meeting.

City Administrator

- AR announced that there will be fireworks July 1st with food, fun and games. Details will be available on the City website.

Mayor

- Congratulated the students who participated in the ACE program as well as the graduating class of 2018. Congratulated 17-year-old Beacon High student Lenny Torres on being drafted by the Cleveland Indians. Announced he will not be here for the next Council meeting and that GM will be Acting Mayor.

LOCAL LAWS AND RESOLUTIONS

1. Resolution to adopt a local law to amend Chapter 195 of the Code of the City of Beacon concerning Lot Line Adjustments

⇒ Tabled.

2. Resolution to authorize Mayor or City Administrator to sign an agreement with Millennium Strategies for Grant Writing and Administrative Services

⇒ A **motion was made** by TN, seconded by JR **to adopt**. The **motion was carried** unanimously by roll call vote.

3. A resolution recommending city council and planning board consider requiring that on certain projects a copy of the site plan and architectural renderings of the project be posted on the property at the commencement of construction

- ⇒ Prior to voting the Council agreed to amend the language in the resolution, striking out “to consider”
- ⇒ A **motion was made** by GM **to adopt** amended resolution, seconded by TN. The **motion was carried** unanimously by voice vote.

4. Resolution authorizing execution of license agreement for dumpsters

- ⇒ A **motion was made** by TN **to adopt**, seconded by GM. The **motion was carried** unanimously by voice vote.

5. A resolution to set a public hearing for July 16th to receive public comment on a proposed local law to amend Chapter 191, Article II and Chapter 192, Section 30 concerning Street and Sidewalk Opening Permits

- ⇒ A **motion was made** by TN **to adopt**, seconded by JM. The **motion was carried** unanimously by voice vote.

APPROVAL OF MINUTES

- ⇒ A **motion was made** by AG, seconded by TN **to approve** the minutes from June 4, 2018. The **motion was carried** by voice vote.

BUDGET AMENDMENTS

- ⇒ A **motion was made** by JM, seconded by TN **to approve**. The **motion was carried** unanimously by roll call vote.

2ND OPPORTUNITY FOR PUBLIC COMMENT

Speakers

- James Pentalo talked about the ferry landing property; 5G technology; keeping spaces open for public use and redesign of the MTA station.

ADJOURNMENT

- ⇒ A **motion was made** by JM, seconded by TM to adjourn. **Motion was carried** unanimously by voice vote. **Meeting was adjourned** at 8:47 PM.

Next Council Workshop is June 25th at 7:00 PM.

Next Council Meeting is July 2nd at 7:00 PM.

A video recording of this meeting in its entirety can be found here -<http://www.cityofbeacon.org/Government/videos.htm>

Submitted by Lisa Edelson

Date: 6/18/2018

Please ~PRINT~ your name **CLEARLY** so we can spell it correctly in the record.

Thank you!

Please check:

PRINTED Name	General Comment	Public Hearing	Address	Preferred contact info
1 NOE BAXTER ✓	✓		7 RYAN AVE	440-6384
2 SCOTT GILSON ✓		✓	5 PAC. JACOBI DR.	
3 DENNIS PAVELOCK ✓	✓		34 JUDSON ST	
4 APRIL O'FARLEY ✓	✓		BENSON, N.J.	
5 STOSH YANKOWSKI ✓	✓	✓	S. CHESTNUT ST.	
6 JUSTIN SKINNER ✓	✓	✓	PROSPECT ST	
7 JASON HUGHES ✓	✓		16 HANNA LN	
8 HAZEL TURNER ✓		✓		
9 DAVID SMOLEN ✓		✓	4 DEW/NOT ST	
10 SHARON WATTS ✓	✓		44 MASTERS PL	845.831.8168
11 NELLE FOSTER ✓		✓	45 BACON ST	518-274-2518
12 LUSHITA FOWLER ✓		✓	144 MAIN ST	845-214-4772
13 ERESA KRAST ✓	✓	✓	LIBERTY ST.	

From: ~~Kathryn Stauffer~~
Subject: Dafna Tachover gives testimony to Michigan House Energy Policy Committee on the dangers of 5G
Date: June 17, 2018 at 8:33 PM
To:

June 18, 2018
Hope Terina

Hello Friends,

We are so proud of Dafna Tachover for all her hard work on behalf of the EHS Community.

She spent 6 weeks lecturing in the state of Michigan and then several more in the state of Oregon.

She has been giving her whole life to the cause. We are grateful.

Dafna Tachover gives testimony to Michigan House Energy Policy Committee on the dangers of 5G:
<https://www.youtube.com/watch?v=ITo7imWb5bM>

Please support Dafna Tachover & "We are the Evidence."

<https://wearetheevidence.org>

Sincerely,

Kathryn Stauffer

Planetary Emergency

PLANETARY EMERGENCY

The Earth needs your help. Now.

Many are the assaults on our planet. The oceans—Jacques Cousteau said it already in 1970—are dying. The majestic wilderness is no more. The very oxygen we breathe is being converted to carbon dioxide.

Others are wrestling with those problems, and they are not going to be solved overnight. But there is one that must be: we must leave space alone.

On March 29, 2018, the Federal Communications Commission gave its approval to SpaceX's plan to launch an unprecedented 4,425 satellites into low orbit around the Earth. And that's only the beginning. SpaceX has applied to the FCC to increase the number of satellites to 12,000 in order to provide "ultrafast, lag-free Internet" to every square inch of the earth. 5G from space. SpaceX's CEO, Elon Musk, has announced his intention to begin launches in 2019, to begin operating as soon as he has about 100 satellites in orbit, and to have at least 800 satellites up and running by 2020. The name of SpaceX's project is "Starlink."

The global electrical circuit, which sustains all life, is about to be seriously disturbed unless we act.

Recent History

In 1997, in my first book, *Microwaving Our Planet*, in the last chapter, titled "The Danger from Satellites," I wrote: "The proliferation of satellites we are about to witness—unless this world wakes up soon—is mind boggling, and nobody seems to have considered that popping thousands of them up there like so much confetti might have consequences for our atmosphere and our climate." I wrote about the expected ozone loss; the destruction of the Van Allen belts; global warming from the addition of water vapor to the stratosphere; toxic wastes; groundwater pollution; space junk; microwave radiation; and the vandalism of the night sky. My 1997 book is posted here, courtesy of the Spanish website AVAATE, one of the best websites on this issue: www.avaate.org/IMG/doc/Microwaving_Our_Planet_firstenberg.doc

A year later the radiation problem asserted itself. On September 23, 1998, the world's first satellite phones became operational. Service was provided by 66 satellites in low orbit around the Earth, launched by the Iridium Corporation. They unleashed a new kind of rain that turned the sky red and emptied it of birds for a couple of weeks.

A six-nation telephone survey was done of electrically sensitive people, support groups, and nurses and physicians serving this population. The results: 86% of electrically sensitive people and a majority of patients and support group members became ill on Wednesday, September 23 exactly, with typical symptoms of electrical illness including headaches, dizziness, nausea, insomnia, nosebleeds, heart palpitations, asthma attacks, ringing in the ears, etc. Follow-ups revealed that some of these people were acutely ill for up to three weeks. Some were so sick they weren't sure they would live. In the United States the national death rate rose by 4% to 5% for two weeks. During those two weeks, very few birds were seen in the sky and thousands of homing pigeons failed to return home in pigeon races throughout much of the country. This was all documented in *No Place to Hide, Vol. 2, No. 1, Feb. 1999, pp. 3-4*.

The second satellite service, Globalstar, began commercial service on Monday, February 28, 2000. Widespread reports of nausea, headaches, leg pain, respiratory problems, depression, and lack of energy began on Friday, February 25, the previous business day, and came from people both with and without electrical sensitivity. See *No Place To Hide, Vol. 2, No. 3, March 2000, p. 18*.

Iridium, which had gone bankrupt in the summer of 1999, was resurrected by a contract with the United States Armed Forces. On March 30, 2001, commercial service resumed. Again the sky turned red. Again came reports of nausea, flu-like illness and feelings of oppression. But the events that made the news were catastrophic losses of race horse foals that were reported throughout the United States and as far away as Peru. On June 5, 2001, Iridium added data and Internet to its satellite phone service. Again came widespread reports of nausea, flu-like illness and oppression, and this time also hoarseness. See *No Place To Hide, Vol. 3, No. 2, Nov. 2001, p. 15*.

Additional details are provided in chapter 17 of my new book, *The Invisible Rainbow: A History of Electricity and Life*.[*]

Between 2001 and now, our skies have not essentially changed. Iridium and Globalstar, operating 66 and 40 satellites respectively, are still the only providers of satellite phones. The amount of data raining on us all from space is still dominated by those two fleets. The predicted fleets of thousands of satellites have not materialized. But they are about to now, unless we stop them. Everything we know and love is at stake—not just hawks and geese, pigeons and race horses, not just the human race, but life itself. This is a mortal threat not just to our children and grandchildren, but to all of us, immediately, within two years.

The Details

The biggest threats are from Boeing, OneWeb, and SpaceX, all of which have similar applications before the FCC. SpaceX's 12,000 satellites will operate in two constellations, at 700 miles and 210 miles in altitude. They will operate at millimeter wave frequencies and they will be phased arrays. Each satellite will have thousands of antenna elements that will aim focused, steerable beams at any desired point on the surface of the earth. Each beam from the 4,425 satellites already approved at the 700-mile height would have a maximum effective radiated power of up to 8,800 watts. The revised application for 12,000 satellites is requesting an increase to 5,000,000 watts per beam (for the upper constellation of



4,425 satellites) and 500,000 watts per beam (for the lower constellation of 7,518 satellites). The satellites will communicate both with individual users and with gateway earth stations, of which there will be several hundred just in the United States.

OneWeb's founder and Executive Chairman is Greg Wyler. So far, OneWeb has applied to the FCC for only 4,540 satellites, but it is partnering with Airbus, which will build the satellites; Blue Origin, a subsidiary of Amazon, which will provide the rockets; and Virgin Galactic, which will launch them. Its investors include Qualcomm, Hughes Network Systems, Intelsat of Luxembourg, Marker LLC of Israel, Grupo Salinas of Mexico, SoftBank of Japan, Bharti Enterprises of India, and Coca-Cola. It received a license from the FCC for 720 low-orbit satellites in June 2017, but has already sold most of their capacity to Honeywell and other companies. Honeywell plans to use satellite transmissions to supply fast Internet to business, commercial, and military aircraft worldwide. On January 4, 2018 OneWeb filed an application for an additional fleet of 2,560 medium-orbit satellites, and on March 19, 2018 it filed an application for 1,260 additional low-orbit satellites. It is now touting its enterprise as an essential element of the worldwide rollout of 5G technology. Like SpaceX, OneWeb's satellites will have antennas in phased arrays and use the millimeter wave spectrum. Their maximum effective power will be 6,000 watts. OneWeb intends to launch 36 satellites every 21 days beginning in the last quarter of 2018, and to begin service with the first few hundred satellites in 2019.

Boeing, which has its own plans for a fleet of 2,956 low-orbit satellites, and already has FCC approval for them, may now be backing OneWeb. In December, Boeing asked permission from the FCC to transfer its license for the 2,956 satellites to a company named SOM1101 LLC. Greg Wyler, the founder of OneWeb, is the sole owner of SOM1101.

A fourth company, Telesat Canada, was granted an FCC license on November 3, 2017. It plans to have a minimum of 117 satellites up and running by 2021. It intends to add satellites "as needed" to increase capacity. These satellites will also be phased arrays and they will also be for global internet to "unserved and underserved" communities, businesses, governments and individuals. They will have a maximum effective power of 8,000 watts.

Iridium, in an effort to compete with all these new companies, is presently in process of replacing its original fleet with a new fleet of 66 satellites called Iridium Next that will offer additional services.

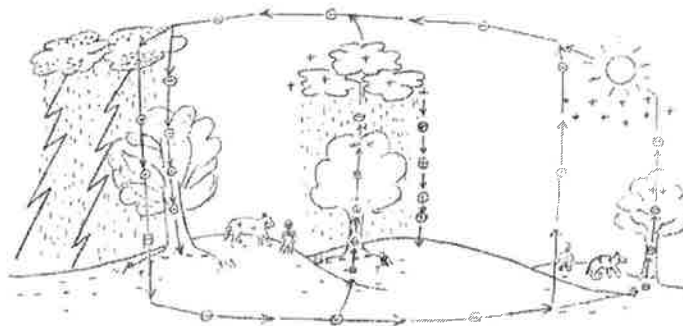
These five companies together have approved and pending applications before the FCC for almost 20,000 low and medium orbit satellites to provide Internet to the world from space.

If 66 satellites providing only voice communication caused widespread illness and mortality among birds, horses, and people, what will a 20,000-satellite Internet-in-the-Sky do to us all?

The Way to Understanding

The original Iridium satellites were (and are still) at 1,000 watts of effective power and 483 miles in altitude. They are spread out around the Earth so that only one satellite is above any given point on the earth at any time. If a 1,000-watt tower were to be placed on a mountaintop that was 483 miles from the nearest person, no one would be alarmed. Why, then, worry about satellites in space? Five million watts is a lot scarier, but even a 5-million-watt beam from 700 miles away will produce a power level of only 13 picowatts (trillionths of a watt) per square centimeter on the ground, a level that is far below the levels most of us are exposed to already from WiFi, cell phones, and cell towers.

The answer has to do with what atmospheric physicists call the global electrical circuit, and with what Chinese medicine calls qi. Electricity is not only something "out there" that powers our lights and machinery, it is the force that orchestrates growth and healing and keeps us alive. The global electrical circuit flows through the earth, up to the sky in thunderstorms, through the ionosphere, and back down to earth through the atmosphere and through our bodies. The current enters our bodies through the top of our head, circulates through our acupuncture meridians, and reenters the earth through our feet. In addition to direct current, it contains 8 Hz, 14 Hz, 20 Hz, 26 Hz, and 33 Hz components. These ELF frequencies are the Schumann resonances, and are identical to the brain wave frequencies of every animal. It also contains VLF frequencies. These are generated by lightning, vary seasonally, and regulate our annual biorhythms. We pollute this circuit at our peril.



From *The Invisible Rainbow: A History of Electricity and Life* (2017) [1]
Chapter 9, "Earth's Electric Envelope"

The strength of the atmospheric electrical current is between 1 and 10 picoamperes (trillionths of an ampere) per square meter. Dr. Robert Becker found that 1 picoampere is all the current that is necessary to stimulate healing in frogs. (R.O. Becker and G. Selden, *The Body Electric*, New York: Morrow 1985, p. 142; R.O. Becker and A.A. Marino, *Electromagnetism and Life*, Albany: State University of New York Press 1982, pp. 49-51). It is these tiny currents that keep us alive and healthy.

The experiences of astronauts are a clue to the importance of the global electrical circuit to terrestrial life. The International Space Station is not

completely outside of it; the Schuman resonances are clearly detectable even at that altitude, but they are greatly diminished. In the Space Station, astronauts' circadian rhythms are disrupted. See John R. Ball and Charles H. Evans, Jr., editors, *Safe Passage: Astronaut Care for Exploration Missions*, National Academies Press 2001. And Russian authors have noted that "a decrease in all physiological processes" occurs during space missions and that these changes are "identical to those that occur during the process of aging on Earth." (Irina M. Lirina et al., "Protein expression changes caused by spaceflight as measured for 18 Russian cosmonauts," *Nature, Scientific Reports* 7:8142 (2017)). It is doubtful that human beings could long survive if completely removed electrically from Earth, for example in a colony on Mars such as Elon Musk is also contemplating.

Power Line Harmonic Radiation

Another piece of the puzzle is provided by research that has been done at Stanford University and elsewhere on the properties of the ionosphere and magnetosphere—the regions of space hundreds to thousands of miles above our heads that contain mostly electrons, protons, and other electrically charged ions.

It was discovered more than forty years ago that ELF and VLF radiation from all of the power lines on earth is reaching the ionosphere, and the magnetosphere above it, where it is being amplified up to one hundred thousand-fold by interaction with electrons. As a result, the earth's electromagnetic environment has been changed. The behavior of the magnetosphere, the structure of the Van Allen belts, the values of the Schumann resonances, and even the weather here on earth, have been altered. This phenomenon is called "power line harmonic radiation."

It was further discovered that the radiation from VLF radio stations is also amplified tremendously in the magnetosphere—so much so that a radio signal of 0.5 watts sent from an antenna in Antarctica can be detected by a receiver in northern Quebec.

Dirty Electricity on the Global Circuit

What does this have to do with SpaceX and OneWeb? Or, to rephrase the question, if a single half-watt radio station broadcasting from the earth has a measurable effect on the magnetosphere, what effect will 20,000 satellites, some located directly in the ionosphere and some directly in the magnetosphere, each blasting out up to five million watts—what effect will that have on life below?

The answer has to do with the fact that the satellite signals—like all wireless signals today—will be pulsed at ELF and VLF frequencies. That is how the data will be sent. Like an AM radio, the ionosphere and magnetosphere will demodulate, or extract, the ELF and VLF components, and then amplify them tremendously. Until now nobody has looked for these effects from satellites. But a Stanford physicist with whom I have been corresponding explained why this could happen and showed me how to estimate the minimum power level that would be necessary. Iridium had enough power, and the new satellites will have more than enough power: as a rough estimate, the five-million-watt SpaceX beams will contain enough energy up to a distance of 135 miles from each satellite for their ELF/VLF components to be demodulated by the ionospheric plasma and then amplified in the magnetosphere.

The result is similar to how dirty electricity gets onto house wiring. All of the electronic equipment—dimmer switches, fluorescent lamps, computers, cell phone chargers, etc.—that are plugged into our walls, produce electronic noise that travels on the wiring, radiates into our homes, and makes us sick.

Except that now the dirty electricity will get onto our *bodies'* wiring. The noise from 20,000 satellites that are plugged into the ionosphere will pollute the global electrical circuit that we are all plugged into. It will kill us and it must be stopped.

It is not only the number of satellites but the number of customers they will serve that is the problem. A cell tower is more harmful than a radio station because instead of emitting just one signal it emits hundreds. Iridium is so impactful not only because it has 66 satellites but because it serves more than a million customers. Because of Iridium and Globalstar, standing barefoot on the earth is no longer as healthful and invigorating as it once was, anywhere on the planet. Grounding yourself increases the flow of qi through your body, but the qi now has electronic noise on it. SpaceX's initial goal is to sign up 40 million subscribers. If OneWeb signs up another 40 million, and one-tenth of the subscribers are online at any given time, electronic noise from an additional 8,000,000 signals, to start with, will pollute the global circuit.

There are other serious environmental impacts from the intensive use of space, some of which I outlined in my first book. For example, the rockets of both SpaceX and OneWeb will burn kerosene. Burning kerosene in space produces prodigious amounts of black soot, which accumulates in the stratosphere. Black carbon absorbs so much solar energy that its contribution to global warming is two million times greater per unit mass than carbon dioxide. Just 35 launches of SpaceX's Falcon Heavy rocket per year would produce an amount of warming roughly equal to the amount of warming produced in a year by the world's one billion cars. I am extrapolating from the estimates of Martin Ross of the Aerospace Corporation, which were made in 2012 when there were 25 launches per year of much smaller kerosene-burning rockets. (M. N. Ross and P. M. Sheaffer, "Radiative forcing caused by rocket engine emissions," *Earth's Future* 2: 177-196 (2014)).

As Ross points out, the problem of black soot could be solved, or at least reduced, by using a different type of fuel. The radiation problem, however, by definition cannot be solved, because the radiation is the product. The decision-makers and investors in these companies must be made to understand that they are playing with fire, and that what they are planning to do within the next two years will have fatal consequences.

The key players are:

For SpaceX:	Residence
Chief Officers	
Elon Musk, CEO	Bel Air, CA
Gwynne Shotwell, President and COO	Rolling Hills Estates, CA
Bret Johnson, CFO	Los Angeles area

Board of Directors

David S. Kidder, CEO of Bionic Solutions	Rye, NY
Luke Nosek, founder and partner of Gigafund	San Francisco, CA
Antonio Gracias, founder, Valor Equity Partners	Chicago, IL
Donald Harrison, Google's vice president for corporate development	Mountain View, CA
Kimbal Musk (Elon's younger brother)	Boulder, CO
Barry Schuler, advisor	Napa, CA

Lead Investors

Fidelity Investments (Abigail Johnson, CEO)	(Boston, MA)
Google (\$900 million)	
Nihal Mehta, founding partner of Eniac Ventures	New York, NY
Bracket Capital (Yalda Aoukar, CEO)	(London)

For OneWeb:**Board of Directors**

Greg Wyler, Founder and Chairman	Stuart, FL
Eric Béranger, CEO	Paris, France
Thomas Enders, CEO of Airbus	Toulouse, France
Paul E. Jacobs (also on board of Dropbox)	Sacramento area
Alex Clavel, Head of Corporate Finance, SoftBank	Palo Alto, CA
Ohad Finkelstein, Co-Founder, Marker LLC	Israel
Ricardo Salinas, Founder of Grupo Salinas	Mexico City

Large Investors

Stephen Spengler, CEO of Intelsat	Luxembourg
Jeff Bezos, CEO of Amazon	Medina, WA
Richard Branson, CEO of Virgin Galactic	British Virgin Islands
Sunil Mittal, CEO of Bharti Enterprises	New Delhi, India
Dean Manson, Executive VP, Echo Star	Englewood, CO

Biggest Customer

Honeywell (Darius Adamczyk, CEO)	(Morris Plains, NJ)
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Owner of Satellite License

Boeing (Dennis Muilenburg, CEO)	(Collinsville, IL)
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All these people have families and children and have a stake in the future of the Earth. Some—for example, Kimbal Musk and his wife, Christiana—are long-time advocates for the environment and investors in environmental causes.

Please contact me if you want to help. What is needed is a team of dedicated people who can raise funds, mobilize scientists, petition governments, and call and meet with environmental organizations.

Also please contact me if you know any of the gentlemen or ladies I have listed above, or if you know someone who can get us an audience with one of them. All we need is one. An opening into that community of billionaires, to begin a dialogue that will save this planet.

Arthur Firstenberg, for
Global Union Against Radiation Deployment from Space (GUARDS)
May 14, 2018
(505) 471-0129

[*] *The Invisible Rainbow* is available at <http://www.cellphonetaskforce.org/buy-the-invisible-rainbow>

5G - FROM BLANKETS TO BULLETS

by Arthur Firstenberg

The single most important fact about 5G that nobody is talking about is called "phased array." It will totally change the way cell towers and cell phones are constructed and will transform the blanket of radiation which has enveloped our world for two decades into a million powerful beams whizzing by us at all times. Blake Levitt, author of *Electromagnetic Fields: A Consumer's Guide to the Issues and How to Protect Ourselves* (Harcourt Brace, 1995), brought this to my attention. A mutual friend, with whom I was speaking during the campaign to defeat S.B. 649 in California, passed on a message from Blake: "5G antennas will be phased arrays; Arthur will know what that means." And I did.

Phased arrays were one of the first things I learned about in the very beginning of my long, involuntary journey from medical student to campaigner against wireless technology. After I was injured by X-rays in 1980, I began to read everything I could get my hands on that had to do with electromagnetic radiation and its effects on life. And one of the first books I read was Paul Brodeur's *The Zapping of America* (W.W. Norton, 1977).

Early warnings

Brodeur was a staff writer for the *New Yorker* who had purchased property on Cape Cod, Massachusetts, only to discover that 30 miles inland, across the bay from his future home, the Air Force was planning to construct the world's most powerful radar station. It was going to scan the Atlantic Ocean as a key early warning element protecting us against the threat of sea-launched ballistic missiles from the Soviet Union. Although it emitted an average power of only 145,000 watts, similar to some FM radio stations, it did not broadcast that energy from only a single antenna and it did not spread that energy out uniformly in all directions. Instead, it had 3,600 antennas arranged in two "phased arrays" of 1,800 antennas each. The antennas in each array worked together as a unit to focus all their energy into a narrow, steerable beam. Each beam had an effective power of four billion watts, and the peak radiation level exceeded 0.3 milliwatt per square centimeter—the FCC's safety limit today—at a distance of ten miles in front of the radar station. The facility was called PAVE PAWS (Precision Acquisition of Vehicle Entry Phased Array Warning System).

The Defense Department acknowledged in a 1975 report, quoted by Brodeur, that such systems "energize thousands of operational elements, are electronically steered at high search rates, and operate at a frequency range having a maximum whole body energy transfer to man and for which little bioeffects data exists."

Shortly after I read this, I discovered firsthand what some of the bioeffects were. Attempting to finish my M.D. almost cost me my life. I collapsed one day with all the symptoms of a heart attack, whereupon I resigned from school and moved up to Mendocino to recover. There I was in the path of the other PAVE PAWS, the one that scanned the Pacific Ocean. This PAVE PAWS was due east of Mendocino, in California's Central Valley at Beale Air Force Base. And for nine months, every evening at precisely 7:00 p.m., no matter where I was or what I was doing, my chest would tighten and I would be unable to catch my breath for the next two hours. At precisely 9:00 p.m., my body would relax and I could breathe. I lived in Mendocino from 1982 through 1984, and although I eventually recovered my health, I was always aware of an uncomfortable pressure in my chest whenever I was on the coast. I also lived in Mendocino from 1999 to 2004, and felt that same discomfort whenever I was there, and always felt it suddenly vanish when I drove out of range of PAVE PAWS, and suddenly return at the same point on my journey home.

Directed beams

5G is going to be at a much higher frequency range, which means the antennas are going to be much smaller—small enough to fit inside a smartphone—but like in PAVE PAWS they are going to work together in a phased array, and like in PAVE PAWS they are going to concentrate their energy in narrow, steerable high power beams. The arrays are going to track each other, so that wherever you are, a beam from your smartphone is going to be aimed directly at the base station (cell tower), and a beam from the base station is going to be aimed directly at you. If you walk between someone's phone and the base station, both beams will go right through your body. The beam from the tower will hit you even if you are standing near someone who is on a smartphone. And if you are in a crowd, multiple beams will overlap and be unavoidable.

At present, smartphones emit a maximum of about two watts, and usually operate at a power of less than a watt. That will still be true of 5G phones, however inside a 5G phone there may be 8 tiny arrays of 8 tiny antennas each, all working together to track the nearest cell tower and aim a narrowly focused beam at it. The FCC has recently adopted rules allowing the effective power of those beams to be as much as 20 watts. Now if a handheld smartphone sent a 20-watt beam through your body, it would far exceed the exposure limit set by the FCC. What the FCC is counting on is that there is going to be a metal shield between the display side of a 5G phone and the side with all the circuitry and antennas. That shield will be there to protect the circuitry from electronic interference that would otherwise be caused by the display and make the phone useless. But it will also function to keep most of the radiation from traveling directly into your head or body, and therefore the FCC is allowing 5G phones to come to market that will have an effective radiated power that is ten times as high as for 4G phones. What this will do to the user's hands, the FCC does not say. And who is going to make sure that when you stick a phone in your pocket, the correct side is facing your body? And who is going to protect all the bystanders from radiation that is coming in *their* direction that is ten times as strong as it used to be?

And what about all the other 5G equipment that is going to be installed in all your computers, appliances, and automobiles? The FCC calls handheld phones "mobile stations." Transmitters in cars are also "mobile stations." But the FCC has also issued rules for what it calls "transportable stations," which it defines as transmitting equipment that is used in stationary locations and not in motion, such as local hubs for wireless broadband in your home or business. The FCC's new rules allow an effective radiated power of 300 watts for such equipment.

Enormous power

The situation with cell towers is, if anything, worse. So far the FCC has approved bands of frequencies around 24 GHz, 28 GHz, 38 GHz, 39

GHz, and 48 GHz for use in 5G stations, and is proposing to add 32 GHz, 42 GHz, 50 GHz, 71-76 GHz, 81-86 GHz, and above 95 GHz to the soup. These have tiny wavelengths and require tiny antennas. At 48 GHz, an array of 1,024 antennas will measure only 4 inches square. And the maximum radiated power from a base station will probably not be that large—tens or hundreds of watts. But just as with PAVE PAWS, arrays containing such large numbers of antennas will be able to channel the energy into highly focused beams, and the *effective* radiated power will be enormous. The rules adopted by the FCC allow a 5G base station operating in the millimeter range to emit an effective radiated power of up to 30,000 watts per 100 MHz of spectrum. And when you consider that some of the frequency bands the FCC has made available will allow telecom companies to buy up to

3 GHz of contiguous spectrum at auction, they will legally be allowed to emit an effective radiated power of up to 900,000 watts if they own that much spectrum. The base stations emitting power like that will be located on the sidewalk. They will be small rectangular structures mounted on top of utility poles.

The reason the companies want so much power is because millimeter waves are easily blocked by objects and walls and require tremendous power to penetrate inside buildings and communicate with all the devices that we own that are going to part of the Internet of Things. The reason such tiny wavelengths are required is because of the need for an enormous amount of bandwidth—a hundred times as much bandwidth as we formerly used—in order to have smart homes, smart businesses, smart cars, and smart cities, i.e. in order to connect so many of our possessions, big and small, to the internet, and make them do everything we want them to do as fast as we want them to do it. The higher the frequency, the greater the bandwidth—but the smaller the waves. Base stations have to be very close together—100 meters apart in cities—and they have to blast out their signals in order to get them inside homes and buildings. And the only way to do this economically is with phased arrays and focused beams that are aimed directly at their targets. What happens to birds that fly through the beams, the FCC does not say. And what happens to utility workers who climb utility poles and work next to these structures everyday? A 30,000-watt beam will cook an egg, or an eye, at a distance of a few feet.

The power from a base station will be distributed among as many devices as are connected at the same time. When a lot of people are using their phones simultaneously, everyone's phone will slow down but the amount of radiation in each beam will be less. When you are the only person using your phone—for example, late at night—your data speed will be blisteringly fast but most of the radiation from the cell tower will be aimed at you.

Deep penetration into the body

Another important fact about radiation from phased array antennas is this: it penetrates much deeper into the human body and the assumptions that the FCC's exposure limits are based on do not apply. This was brought to everyone's attention by Dr. Richard Albanese of Brooks Air Force Base in connection with PAVE PAWS and was reported on in *Microwave News* in 2002. When an ordinary electromagnetic field enters the body, it causes charges to move and currents to flow. But when extremely short electromagnetic pulses enter the body, something else happens: the moving charges themselves become little antennas that re-radiate the electromagnetic field and send it deeper into the body. These re-radiated waves are called Brillouin precursors. They become significant when either the power or the phase of the waves changes rapidly enough. 5G will probably satisfy both requirements. This means that the reassurance we are being given—that these millimeter waves are too short to penetrate far into the body—is not true.

In the United States, AT&T, Verizon, Sprint, and T-Mobile are all competing to have 5G towers, phones, and other devices commercially available as early as the end of 2018. AT&T already has experimental licenses and has been testing 5G-type base stations and user equipment at millimeter wave frequencies in Middletown, New Jersey; Waco, Austin, Dallas, Plano, and Grapevine, Texas; Kalamazoo, Michigan; and South Bend, Indiana. Verizon has experimental licenses and has been conducting trials in Houston, Eufaula, and Cypress, Texas; South Plainfield and Bernardsville, New Jersey; Arlington, Chantilly, Falls Church, and Bailey's Crossroads, Virginia; Washington, DC; Ann Arbor, Michigan; Brockton and Natick, Massachusetts; Atlanta; and Sacramento. Sprint has experimental licenses in Bridgewater, New Brunswick, and South Plainfield, New Jersey; and San Diego. T-Mobile has experimental licenses in Bellevue and Bothell, Washington; and San Francisco.

— January 22, 2018

STATEMENTS BY PHYSICIANS, SCIENTISTS AND HEALTH POLICY EXPERTS

Andrew Weil, MD:

"Electromagnetic pollution may be the most significant form of pollution human activity has produced in this [20th] century."
<http://www.drweil.com/dnwl/ufid/QAA26193>

Robert Becker, Ph.D Nobel Prize nominee noted for decades of research on the effects of electromagnetic radiation says,

"I have no doubt in my mind that, at present time, the greatest polluting element in the earth's environment is the proliferation of electromagnetic fields."

The following quotations are available at: http://www.stralingsrisicos.nl/index.php?option=com_content&view=article&id=23&Itemid=6

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, Ph.D 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 electrosensitive 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 electrosensitive 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."

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."

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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."

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."

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."

**For identification purposes only: All statements are mine and mine alone and do not represent positions or opinions of the Central Brain Tumor Registry of the United States, the Bioelectromagnetics Society or the Brain Tumor Epidemiological Consortia.*

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."

Paul J. Rosch, MD Clinical Professor of Medicine and Psychiatry, New York Medical College; Honorary Vice President International Stress

Management Association; Diplomate, 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."

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