

The Stockholm Declaration about “Life EMC”

Olle Johansson

All around the world dramatic reductions in pollinating insect populations are noted, for instance in Germany, in 2017, where more than 75% of them were reported just gone, and recently the media have reported a more than 90% reduction of the bumblebee populations in the USA (2021). Many beekeepers can also witness similar decreases in honey bee populations as well as in other insect groups, and so can the ordinary citizens.

I am particularly concerned about this problem, and I already have a number of papers dealing with the impact of artificial electromagnetic fields (EMFs) from wireless communication such as cell phones, WiFi systems, tablets, baby alarms, smart meters, laptops and more, especially on honey bees (see e.g. Johansson O, “To bee, or not to bee, that is the five “G” question,” Newsvoice. se 28/5, 2019, <https://newsvoice.se/2019/05/5g-question-olle-johansson/>). I also know that other areas around the world have reported extensive bee colony collapses, and my strong effort now is to seek ways to conserve, protect and enhance our pollinators, wherever they reside, and thus conserve, protect and enhance ourselves, and our coming generations. If we do not engage, then we certainly may head towards a moment in history where future generations - if any - will ask us “*Why didn't you react and act?*”

Against the above, I am trying hard - together with the various collaborating teams - to set various projects into motion, and especially regarding the “NO BEES = NO FOOD = NO CHILDREN” one. Remember this: “*While governments have authority, the people have the power. Change can be caused if this power is used.*” Brett Dolter (Saskatchewan Opinion). Maybe this people’s power – aka you! - is more needed than ever, especially since when my collaborator Robert Ferm and myself, already on October 19, 2021, wrote to the U.S. Fish

and Wildlife Service, 5275 Leesburg Pike, Falls Church, VA 22041-3803, USA, attention: Louise Clemency, Chicago Ecological Services Field Office, about the American bumblebee situation *versus* impacts of artificial electromagnetic fields (EMFs), we didn't receive any reply at all.

Currently, as we all know, a lot of things are going on which impact insects... pesticides, deforestation, insecticides, air pollution... as well as consecutive effects such as strong, or very strong, reductions of other species dependent on insects, like birds (https://www.theguardian.com/environment/2021/nov/16/house-sparrow-population-in-europe-drops-by-247m?utm_term=6195156f0b3481e9556e75f3232f7af5&utm_campaign=ThisIsEurope&utm_source=esp&utm_medium=Email&CMP=thisiseurope_email). I therefore hereby will present an idea, a declaration, to help life on the planet.

Artificial electromagnetic fields

Pulsed, modulated, polarized, non-ionizing artificial electromagnetic fields, at various frequencies, including high-frequency radio and microwaves as well as extremely low-frequency electric and magnetic fields, at colossal exposure levels compared to natural background fields and signals, are present in the current, modern environment where there are technology actively emitting this kind of radiation and these kinds of fields and signals. We use them for our radio and TV transmissions bringing news, weather, debate, and entertainment to our homes; for powerlines distributing electricity to workplaces and homes; for cell phone systems, wireless Internet (WiFi), wireless tablets, laptops, baby alarms, smart meters, electric cars, autonomous robots and vehicles, toys, surveillance, social credit point identification, and many more everyday installations in our modern society. The big question today is if

chronic, localized and/or whole-body exposure to such artificial electromagnetic fields from different kinds of sources are safe for humans and all other biology on planet Earth. This is *the* question having put increasing weight on my science table for the last decades.

“Technical EMC” – “Human EMC” – “Life EMC”

Thanks to strong regulations and laws, different gadgets are not allowed to interact with each other, thus jeopardizing each other’s technical functions. To secure the electromagnetic robustness for this kind of adverse effects, and shielding off interference and/or disturbances, as well as geomagnetic storms, different technologies are tested for so-called “*Technical EMC*” (ElectroMagnetic Compatibility) demands. Many years ago, in a commentary in the Swedish magazine “*Ny Teknik*” (“*Människan är lika känslig som maskinen*” (“The human is as sensitive as the machine,” in Swedish), no. 4, 1997), I launched the idea and new demand that since we protect all our various equipment from radiation interference and damage, we also have to do the same with our own health. In that commentary in “*Ny Teknik*,” I introduced the concept of “*Human EMC*.” Now I take it one step further and point to the need to establish stringent, law-abiding, hygienic absolute safety exposure standards for all life on the planet: “*Life EMC*.”

Technical EMC regulations do not only protect equipment from serious damage but also from electromagnetic disturbances of various types, the latter interfering with the intended functionality, like unwanted background noise during a radio broadcast session, or securing correct altimeter performance of a passenger airliner (<https://www.bloomberg.com/news/articles/2021-11-04/carriers-delay-rollout-of-5g-one-month-due-to-aviation-concerns>). The same goes with “*Life EMC*.” it should not only protect life on this planet from serious damage and

death but also from any form of disturbance, including physiological, genetic, behavioural, functional, and/or anatomic. We, as human beings, do not have any God-given right to disturb the life of other species, and it is becoming overwhelmingly obvious humans already are! I say as Greta Thunberg: “blah, blah, blah” when it comes to real action from our rulers to restore and protect life on this planet.

Greta Thunberg has excoriated global leaders over their promises to address the climate emergency, dismissing them as “blah, blah, blahers.” Thunberg, who recently inspired the global Fridays for Future movement, said that hopes and dreams drown in “empty words and promises” and asked where 30 years of “blah, blah, blah” have led us. *Now I, the author, ask the same when it comes to adverse health and biological effects of artificial electromagnetic fields from all our gadgets, installations and toys. Where is the reaction and Precautionary Principle resulting in real action?! After the recent COP26 in Glasgow ... where are the real good cops?!*

Human health effects

For many years, I have been studying the health and biological effects of wireless gadgets, such as cell phones, WiFi systems, tablets, baby alarms, smart meters, laptops, and similar. Wireless communication is now being implemented in our daily life in a very fast way. At the same time, it is becoming more and more obvious that exposure to electromagnetic fields may result in highly unwanted health and biological effects. This has been demonstrated in a very large number of studies and includes cellular DNA damage (which may lead to the initiation of cancer as well as unwanted mutations that carry down generations of humans, other animals, plants, fungi, bacteria and/or viruses), disruptions and alterations of cellular functions like increases in intracellular stimulatory pathways and calcium handling, disruption of tissue structures like the blood-brain barrier (which may allow toxins to enter the brain), impact on the vessel and immune functions and loss of fertility. It should be noted that we are not the only species in jeopardy; practically all animals, plants, fungi, and bacteria

may be at stake. For the latter, Taheri *et al.* (2017; cf. Johansson O, “Bacteria, mobile phones & WiFi - a deadly combination?,” *Nya Dagbladet* 31/5, 2017, <https://nyadagbladet.se/debatt/bacteria-mobile-phones-wifi-deadly-combination/>) have demonstrated that the exposure to 900 MHz GSM mobile phone radiation (aka “The 2nd Generation Mobile Telephony” or “2G”) and to 2.4 GHz radiofrequency radiation emitted from common Wi-Fi routers, respectively, made *Listeria monocytogenes* and *Escherichia coli* bacteria resistant to different antibiotics. To say this finding is “scary” is a classical English understatement, especially against the everyday clinical situation witnessed every day by health workers around the planet, and against the statement of the World Health Organization (WHO), and others, that antibiotic resistance in health care is a bigger problem than the recent pandemic (for instance, see <https://www.plymouth.ac.uk/news/pr-opinion/a-threat-greater-than-covid-why-we-should-be-paying-more-attention-to-antimicrobial-resistance>).

Because the effects are reproducibly observed and links to pathology can not be excluded, the Precautionary Principle should be in force in the implementation of these new technologies within the society. Therefore, policymakers immediately should strictly control exposure by defining biologically-based maximal exposure guidelines also taking into account long-term, non-thermal effects, and including especially vulnerable groups, such as the elderly, the ill, the genetically and/or immunologically challenged, children and fetuses and persons with the functional impairment electrohypersensitivity (which in Sweden is a group of persons with a fully recognized functional impairment, and therefore it receives an annual governmental disability subsidy). To this, *all* other lifeforms on the planet must now be added.

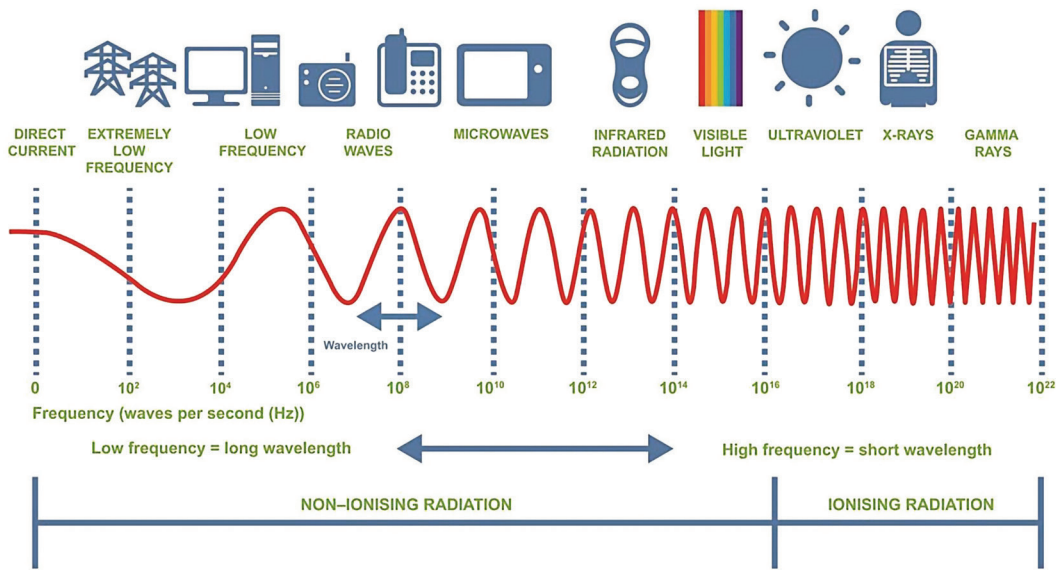
However, at the same time it is of crucial importance to always relate to observations in real life. I have, together with a colleague, for a long time, studied the public human health records and registers of the Swedish Cancer Foundation, the Swedish National Board of Health and Welfare, the Public Health

Agency of Sweden, and the Statistics Sweden, and from them I see no signs of statistically significant incidence increases - at the general public level - during the last 40 years in those human illnesses traditionally attributed to cell phone exposure, and similar, that in any way correlates with the introduction of various communicative techniques. So you might say that reality can not yet replicate the laboratory experimental studies, something that I personally enjoy to the fullest, it certainly makes me very happy *not* having to witness a number of extra patients and extra grieving relatives. (Of course, this does not rule out an effect only seen at the individual level, and under special circumstances, but it has not yet been proven beyond doubt.) However, if we go back to the mid-1950s, and relate to our current times, there is a possible correlation between the introduction of chronic exposure from FM radio broadcast radiation and malignant melanoma as investigated by Johansson O and Hallberg Ö (see e.g. “Malignant melanoma of the skin - not a sunshine story!” *Med Sci Monit* 2004;10: CR336-340, and “FM broadcasting exposure time and malignant melanoma incidence,” *Electromag Biol Med* 2005; 24: 1-8), and currently a lot of firm attention - and rightfully so - is focused on worries around human fertility as visualized in the form of human sperm cell count and quality, both the latter showing a dramatic deterioration around the planet.

Biological effects

The situation is, however, very different when you look out into the life for other species, such as insects, particularly pollinators like honey bees and bumblebees, bacteria and plants. So even if we do not get a brain tumour from our cell phones and wireless tablets, smart meters and baby alarms, we still will, as a species, be under an enormous threat, and a threat that may lead us to realize it is too late to respond to the early warnings sounded decades ago by me and others.

The world has lost two-thirds of its wildlife in the last 50 years, and according to Nathan Rott, in a recent article (<https://www.npr.org/2020/09/10/911500907/the-world-lost-two-thirds-of-its-wild-life-in-50-years-we-are-to-blame>;



sybiotic microbiome, which in turn has electromagnetic properties. This microbiome functions as a cellular ‘organ’ system, i.e. the population of one species of the microbiome acts as an ‘organ’ of its own. Some of the functions of this ‘organ’ system(s) are;

- Assisting in digesting food
- Regulating the immune system
- Regulating neurotransmitters
- Regulating hormones

NPR Radio Station, September 10, 2020), and many, many others, we are to blame. The “Holocene extinction,” otherwise referred to as the “sixth mass extinction” or “Anthropocene extinction,” is an ongoing extinction event of species during the present Holocene epoch (more recently called Anthropocene) as a result of human activity (https://en.wikipedia.org/wiki/Holocene_extinction). We, the humans, have used insecticides to save us and our crops for decades... maybe now it is time for a humanicide to save the insects from us, of course not killing us but at least holding us back from destroying the insects’ life and living space? And an additional Nüremberg Code to protect the animal, plant, and bacteria rights? (Of course, this does not apply to *all* of humanity, and not single-eyed to “human nature” itself. The failings (short-sightedness, greed, lust for power, etc.) of the corporate and banking elites & of our politicians over the past century, or more, can not be blamed on everyone, but now we must *all* take firm action.)

More and more persons are now asking how can we halt this extinction crisis (https://www.biodiversity.org/programs/biodiversity/elements_of_biodiversity/extinction_crisis/). So the \$64,000 question is if any of this is caused by chronic or intermittent artificial electromagnetic fields, and my working hypothesis is that, yes, they may be part of this sixth mass extinction, especially when we look at pollinators – like honey bees - and other similar insects, as well as some other core

species upholding the whole insect community.

So, in essence, science is providing ever more convincing evidence that the radiation emitted by our wireless telecommunications systems can affect biological systems including wildlife as well as – further up the food and environmental chains – humans, pets and livestock. These biological effects are normally acting even at very low exposure levels far below our current public exposure guidelines.

All living beings are electrosensitive, also our microbiome!

Life on this planet, including us humans, is based on a very complex biochemistry and highly intricate electromagnetic forces and signals, thus life may easily be at risk from the chronic exposure to artificial electromagnetic fields and radiation from modern, everyday present, technologies. And given the extraordinary electromagnetic sensitivity of living systems, it is not a surprise that they can be affected even at lower exposure levels, especially if the exposure is ubiquitous and prolonged. And the exposure levels, as you know, are not “low” - compared to the natural background of such frequencies the man-made ones come at colossal, astronomical, biblical levels; just the current 3G systems are allowed at a maximal exposure level of 1,000,000,000,000,000,000 times the natural background! Does that sound reasonable and safe to you?

As indicated above, all biology on earth, including humans, have a

- Protecting against pathogenic bacteria
- Producing vitamins
- Producing antioxidants
- Producing molecules for information exchange
- Cleaning up diseased and dead cells in the body

Hence if chronic exposure from multiple artificial electromagnetic field sources harms any of the species populations of the microbiome organ system, the health of its host is at risk.

Our current recommended safety guidelines for electromagnetic fields and signals are only for acute exposure causing heating of ‘body tissue’ of a fluid-filled plastic doll (thermal effect) from one single event and do not consider chronic exposure from multiple sources resulting in adverse non-thermal biological effects. Therefore, I hereby strongly recommend the Precautionary Principle and that “Life EMC” testing should be applied for all and any electromagnetic field/radiation technology interacting with humans and all other biology on Earth.

Very recently, an amazing scientific paper in the journal *Reviews on Environmental Health*, was formally published as a three-part review that examines effects of non-ionizing electromagnetic fields, including wireless radiation from cell towers and extremely low-frequency electromagnetic fields from power lines, on flora and fauna. This 150-page tome (plus supplements, and more than 1,200 references) is written by B. Blake Levitt, an award-winning

journalist and free-lance journalist for the New York Times, Henry Lai, Professor Emeritus at the University of Washington and Albert Manville, a retired branch manager and senior wildlife biologist in the Division of Migratory Bird Management at the U.S. Fish and Wildlife Service, and an adjunct professor and lecturer for more than two decades at Johns Hopkins University where he has taught field classes in ecology, conservation biology and wildlife management.

The authors point out that ambient levels of electromagnetic fields have risen sharply in the last 80 years, creating a novel energetic exposure that previously did not exist. Most recent decades have seen exponential increases in nearly all environments, including rural/remote areas and lower atmospheric regions. Because of unique physiologies, some species of flora and fauna are sensitive to exogenous electromagnetic fields in ways that may surpass human reactivity. Biological effects have been seen broadly across all taxa and frequencies at vanishingly low intensities comparable to today's ambient exposures. Broad wildlife effects have been seen on orientation and migration, food finding, reproduction, mating, nest and den building, territorial maintenance and defense and longevity and survivorship. In addition, cytotoxic and genotoxic effects have been observed. Plants and animals are not being protected from this damage as there are no standards pertaining to wildlife. The above issues are explored in three consecutive parts by Levitt and coworkers: Part 1 focuses on today's ambient electromagnetic fields' capabilities to adversely affect wildlife, with more urgency regarding 5G technologies; Part 2 explores natural and man-made fields, animal magnetoreception mechanisms and pertinent studies to all wildlife kingdoms; and Part 3 examines current exposure standards, applicable laws and future directions.

Levitt BB, Lai HC, Manville AM, "Effects of non-ionizing electromagnetic fields on flora and fauna, Part 1. Rising ambient EMF levels in the environment," *Rev Environ Health* 2021, May 27. doi: [10.1515/reveh-2021-0026](https://doi.org/10.1515/reveh-2021-0026). Epub ahead of print.

Levitt BB, Lai HC, Manville AM, "Effects of non-ionizing electromag-

netic fields on flora and fauna, Part 2 impacts: how species interact with natural and man-made EMF," *Rev Environ Health* 2021, Jul 8. doi: [10.1515/reveh-2021-0050](https://doi.org/10.1515/reveh-2021-0050). Epub ahead of print.

Levitt BB, Lai HC, Manville AM, "Effects of non-ionizing electromagnetic fields on flora and fauna, Part 3. Exposure standards, public policy, laws, and future directions," *Rev Environ Health* 2021, Sep 27. doi: [10.1515/reveh-2021-0083](https://doi.org/10.1515/reveh-2021-0083). Epub ahead of print.

Furthermore, in a recent paper by Lupi *et al.* ("Combined effects of pesticides and electromagnetic-fields on honeybees: multi-stress exposure," *Insects* 2021; 12, 716. doi: [10.3390/insects12080716](https://doi.org/10.3390/insects12080716)) they conclude "After one year of monitoring, a complex picture of several induced effects was present, especially in the multi-stress site, such as disease appearance (American foulbrood), higher mortality in the underbaskets (common to pesticide stress site), behavioral alterations (queen changes, excess of both drone-brood deposition and honey storage) and biochemical anomalies (higher alkaline phosphatase activity at the end of the season). The multi-stress site showed the worst health condition of the bee colonies, with only one alive at the end of the experimentation out of the four ones present at the beginning." Again, as pointed out many times over the years, the need for further investigation as well as replications is eminent, as is the introduction of the Precautionary Principle and "Life EMC" accreditation.

In no way am I naive, there are – of course – a number of other confounding culprits, and very much interest is already being paid to them. One of these is climate change, and in a recent paper by Soroye *et al.* ("Climate change contributes to widespread declines among bumble bees across continents," *Science* 2020; 367, 685-688. DOI: [10.1126/science.aax8591](https://doi.org/10.1126/science.aax8591)) it is pointed out that "One aspect of climate change is an increasing number of days with extreme heat." Soroye *et al.* analyzed a large dataset of bumble bee occurrences across North America and Europe and found that an increasing frequency of unusually hot days is increasing local extinction rates, reducing colonization and site occupancy, and decreasing species

richness within a region, independent of land-use change or condition. As average temperatures continue to rise, bumblebees may be faced with an untenable increase in frequency of extreme temperatures. We, thus, get interesting combinatorial effects of climate change + chronic exposure to artificial electromagnetic fields + pesticides/insecticides, and how they affect bumblebees and other pollinators. Maybe yet a research project of immediate importance for the bumblebees? And equally so for us, mankind?

While pesticides have long been blamed for the decline in pollinators, a study published in *Proceedings of the Royal Society B* (Cohen H *et al.*, "Mass-flowering monoculture attracts bees, amplifying parasite prevalence," October 13, 2021, <https://doi.org/10.1098/rspb.2021.1369>) has found that the mass-flowering of single plant species is increasing the prevalence of bee populations infected with parasites. If you add to this chronic exposure to electromagnetic fields which will harm the pollinators' immune defense the negative impact of monocultures may be seriously amplified.

With all of this in mind, to me as a scientist, it is becoming more and more obvious that we, the humans, actually often don't have a clue any longer about what we are doing... money, profit & greed rule, but not common sense, and not the Precautionary Principle or "Life EMC" accreditation. Global commercial companies have lobbyists talking for them at ICNIRP (the International Commission on Non-Ionizing Radiation Protection), FCC (the Federal Communications Commission), and IEEE (the Institute of Electrical and Electronics Engineers), within the EU, the UN, the WHO, in Washington, D.C., Geneva, New York, Stockholm, Paris, Rio de Janeiro and elsewhere, but how many powerful lobbyists do the bumblebees, the honey bees and all other pollinators have?

My own studies... and the future

The above papers rhyme very well with my own co-authored or authored publications from the last decade, like:

Cammaerts M-C, Johansson O, "Ants can be used as bio-indicators to reveal biological effects of electromagnetic waves from some

wireless apparatus,” *Electromag Biol Med* 2013; early online: 1-7. DOI: [10.3109/15368378.2013.817336](https://doi.org/10.3109/15368378.2013.817336)

Cammaerts MC, Johansson O, “Effect of man-made electromagnetic fields on common *Brassicaceae* *Lepidium sativum* (cress d’Alinois) seed germination: a preliminary replication study,” *Phyton, International Journal of Experimental Botany* 2015; 84: 132-137

Johansson O, “To bee, or not to bee, that is the five “G” question,” *Newsvoice.se* 28/5, 2019 <https://newsvoice.se/2019/05/5g-question-olle-johansson/>

Favre D, Johansson O, “Does enhanced electromagnetic radiation disturb honeybees’ behaviour? Observations during New Year’s Eve 2019,” *Internat J Research -GRANTHAALAYAH* 2020; 8: 7-14

Based on these papers, and on the above triplet of reviews by Levitt *et al.*, and on many other publications by my eminent peers, I hereby repeat: It is high time to recognize ambient electromagnetic fields as a form of harmful pollution, not so novel any longer but present for decades, and finally develop laws at regulatory agencies that designate the environment as a whole, including the airways, land and sea, as ‘habitat’ for all species, as well as for humans, so electromagnetic fields and signals can be formally and legally regulated like other pollutants. Wildlife loss is often unseen and undocumented until tipping points are reached, and – as many times stressed by me – could lead to catastrophic outcomes. Long-term, chronic, low-level electromagnetic fields exposure standards, which do not now exist, should be set accordingly for wildlife, and environmental laws should be strictly and firmly enforced.

The now applicable limit values for artificial electromagnetic fields are only technical as to their nature, thus no connection to the biological and medical reality exists at all. This in turn means that existing limit values from ICNIRP or FCC (or any other official authority or body) can not be used as a regulatory tool by authorities to protect people or nature from loss of wellbeing, from disturbances, ill health, damages, or from death.

Actually, the whole debate is upside down. Many persons and organizations call for dangerously high values which really only relate to a randomly set technical limit value used by the official authorities around the world as an adaptation to political/industrial lobbyists’ pressure. These technical limit values totally ignore electromagnetic field dosimetry for chronic exposure from multiple radiation sources, using various characteristics as measures, and also not including synergistic, antagonistic, as well as cumulative effects, and its relation to life on this planet.

One should always remember that Professor Paolo Vecchia, head of ICNIRP at the time, at a conference at the Royal Society in London, said this in 2008 about using ICNIRP’s technical guidelines:

“What they are not:

Mandatory prescriptions for safety

The “last word” on the issue

Defensive walls for industry or others”


(verbatim quote from voice recording)

He strongly emphasized that the ICNIRP guidelines are only technical in nature, and never were intended to be used as safety recommendations for medical or biological issues and/or to handle established risks.

It should be noted that only one such **genuine hygienic safety value** ever has been proposed: 0.0000000001-0.000000000001 $\mu\text{W}/\text{m}^2$ [for 1,800 MHz] – this is the natural background during normal cosmic activities; proposed by myself at a trade union meeting in Stockholm, already in 1997 (i.e. one year before the publication of ICNIRP’s 1998 paper on setting public exposure standards), and since then many times repeatedly presented in scientific publications, at conferences, in interviews and more. (Given the highly artificial nature of the current wireless communication signals, e.g. of their pulsations and modulations, it may actually boil down to 0 (zero) $\mu\text{W}/\text{m}^2$ as the true safe level of man-made electromagnetic fields/signals.)

And do not ever believe it is possible to play it “safer” by only somewhat reducing the exposure levels!

(cf. Johansson O, “To understand adverse health effects of artificial electromagnetic fields... ..is “rocket science” needed or just common sense?,” In: *Essays on Consciousness – Towards a New Paradigm* (ed. I. Fredriksson), Balboa Press, Bloomington, IN, USA, 2018, pp 1-38, ISBN 978-1-9822-0811-0). Ironically, this means that even a Precautionary Principle – if it is not firm enough – may not prove precautionary at all. Instead, it could lead to the classical “Late lessons from early warnings” or to “Too late lessons from early warnings” (the latter quote from me). (Are you prepared to risk that for a set of toys, rather than protecting the life necessities we all are dependent on..? Or do you honestly believe our children and grandchildren, in the future, can eat money instead of food?)

If mankind gets real and makes “*Life EMC*” a genuine reality, then mankind has proven itself worthy of living – ‘shoulder-to-shoulder’ with all other species – on this beautiful planet we call home. Rachel Carson’s famous book *Silent Spring* started our modern concern for nature and wildlife. Now it is time to save them through the **The Stockholm Declaration about “Life EMC”**. I therefore, here and now, call upon everyone to demand and implement **The Stockholm Declaration about “Life EMC”**. 

Author Bio

Olle Johansson, associate professor, former head of The Experimental Dermatology Unit, Department of Neuroscience, The Karolinska Institute Medical University, Stockholm, Sweden, and former adjunct professor of The Royal Institute of Technology, also Stockholm, Sweden, now retired (from November 2017).

(If you want to support our research efforts, please, read and share this fundraiser call <https://honeywire.org/research>; always remember that no gift is too small, we badly need the economic support if we should be able to continue our research work regarding the adverse health and biological effects of artificial electromagnetic fields from cell phones, satellites, smart meters, WiFi, baby alarms, tablets, powerlines, laptops, and many more installations. Without your help we can not go forward.)