

# Gaia: *The living, breathing Earth*

BY LEONARDO VINTINI  
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"Nature is Wisdom." Many are familiar with this phrase, but just how true is it?

If we stirred the cauldron of contemporary scientific hypotheses, and considered which among them most blurred the line between the tangible and the divine, we would find the Gaia Hypothesis rising to the top. Yet, over the past four decades as the idea of a "living Earth" continues to collect concrete evidence in its favour, scientists from various fields have become increasingly attracted to it.

What is the Gaia Hypothesis? Named after the ancient Greek Earth goddess, this theory imagines our planet as a living, breathing and self-regulating entity.

Look, for example, at the air we breathe. Oxygen is an indispensable element for practically all living organisms, from bacteria to fish to humans. This gas has for millennia maintained a 21 per cent composition of the Earth's atmosphere due to certain living organisms (plants) that continually liberate it. Oxygen – being a very reactive element – has the potential of combining with other gases and minerals of the Earth's atmosphere and crust, disappearing completely in its liberated form.

But despite this unstable situation, the Earth's atmosphere remains a relatively constant supporter of life. This was one of the observations that the chemist James Lovelock described at a scientific conference held in Princeton in 1969. Challenging the concept of nature as merely a game of chance, Lovelock postulated that the Earth could well work like a gigantic living organism, organising all forms of matter both organic and inorganic with a definite goal to create an environment for sustaining life. Despite his past accomplishments – most notably pioneering sensitive instruments for the Viking spaceship on its Martian exploration – Lovelock's idea of a living earth endured harsh criticism from his colleagues.

Another point Lovelock raised was the unvarying concentration of seawater salinity, which remains at the optimum level for the existence of life. Science has found that the water in rivers constantly drags mineral salts into the ocean, yet when the seawater evaporates to form clouds, it does not bring the salt with it. If we were to follow a strictly logical way of thinking, we would conclude that the concentration of salt in the ocean should increase with the passage of time. But this does not happen. The concentration of salt has remained unchanged for centuries. Accord-

ing to those who support the Gaia Hypothesis, this is due to the ability of a colossal being maintaining an internal equilibrium – a phenomenon that coincides scientifically (though usually applied to cellular organisms) with "homeostasis".

Some believe that the answer behind this peculiar phenomenon may be found in the formation of salt mines: over time water forms a bay and is later landlocked. The water inside evaporates and only the salt is left. This portion of Earth then gets covered with powder and clay, which is eventually converted into solid rock, preventing a possible future river from dragging the salt away. Could this mechanism so casually regulate the concentration of salt, such that the water is never uninhabitable for fish and other sea creatures? According to supporters of the theory, it is not merely a product of accidental circumstances, but rather a process controlled by Gaia herself.

A more recent example supporting the existence of Gaia comes from a discovery made by scientists at the University of Hong Kong, directed by Jiu Liao. During their studies along sea coasts, this team of investigators noticed that the tides seemed to make the coastal floor "breathe" as air and moisture were interchanged through water pressure on the seafloor. This

breathing can be noticed in the most obvious cases as air bubbles that emerge from the coastal floor. The tides seem to influence a rhythmical movement of the ocean floor, causing something which seems identical to respiration, but with a much slower frequency, due, of course, to the Earth's comparatively enormous size.

Evidence for the living, breathing Earth does not stop there: contemporary reports by scientists of Hawaii's Mauna Loa observatory demonstrate that the concentrations of carbon dioxide, from 1955 to 1995, have varied in a rhythmical up-and-down pattern, which, with the evidence collected through geography stations, some interpret as terrestrial inhalation and exhalation.

The Gaia Hypothesis stands against the predominately held notion that the proper conditions for life have been maintained for thousands of years due solely to



chance – isolated processes working independently that just happen to create this tenuous situation. The belief of Earth as a living being is an idea that up to now has gained more sceptics than followers, but minds are changing as evidence continues to emerge.

Earth, as seen from space. The Gaia Hypothesis states that the delicate conditions that favour life on Earth are brought about because the Earth itself is a living organism.

## Top 10 educational tools all students must use

BY MELISSA BURNS

Another autumn has arrived, and students' troubles with academic writing have started all over again. This is a never-ending cycle of academic curriculums becoming more challenging and writing tools becoming more effective. Although professors think of the Internet as something students waste time on, online tools have the potential of making everyone's work much easier.

When you start using the most effective academic writing tools mentioned in this article, you will understand that autumn doesn't have to be the most stressful period of the year.

### 1. Writinghouse.org

When you are required to implement different styles of referencing for different assignments, academic writing takes on a whole other dimension of difficulty. Making a clear difference between the Chicago, MLA and APA style is impossible for a student with lack of experience in academic writing. Writinghouse.org is the tool that will put an end to these troubles, because it implements the required referencing style automatically. This will save you a huge amount of time and nerves, so you can keep your focus on the content of your paper.

### 2. WriteRoom

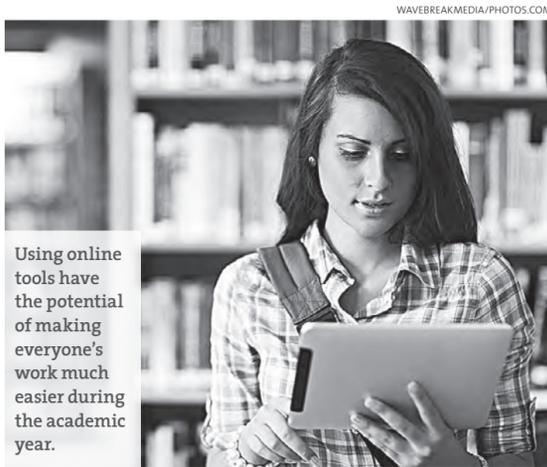
WriteRoom is one of the greatest simplistic writing tools available on the web. The synchronisation and backup options will definitely make you calmer – you will stop being paranoid about losing what you've already written. Moreover, the full-screen writing environment of WriteRoom will keep you away from distractions.

### 3. Q10

Not all students can enjoy writing academic papers, but Q10 is definitely a tool that can make the process more interesting by providing you with many cool features to choose from. The interface is very simplistic – it only shows the page number, character count, and word count of your document. If you want to create an environment free of any distractions, you can easily get rid of that toolbar as well.

### 4. Time Out

The new semester equals to having many assignments you want to complete with excellence in order to create a great first impression. However, spending too much time working in front of the computer is a dead-end street – your energy levels will be drained away and your ability for creative expression will be inhibited. Time Out is a simple freeware program that



Using online tools have the potential of making everyone's work much easier during the academic year.

will make you take breaks during the writing process. Having some time away from the computer will help you come back to your work with renewed energy and new ideas.

### 5. Isolator

If you are looking for a tool that will keep you away from distractions while working on a document, you should start using Isolator. This tool will keep only the active windows visible, and the desktop with all icons will be covered up. With fewer distractions on your way, the process of writing will become much more effective.

### 6. Write Monkey

Every student is looking for a tool that can make the process of academic writing faster and less complicated. If that is your goal, you should use Write Monkey and experience a whole new level of effective simplicity. This tool will enable you to ignore the use of your computer mouse and keep your hands on the keyboard all the time. It may take some time for you to get used to the keyboard shortcuts, but this technique will definitely make you a much faster writer.

### 7. OmmWriter

OmmWriter is arguably the great-

est writing tool for Mac users. When you use OmmWriter for the creation of your documents, you will work in a zen environment that's clean and entirely free of interference. In the same time, you will be able to use some really cool features that will enable you to work more effectively.

### 8. Google Art Project

Writing academic papers is difficult enough when you have sources to draw inspiration from, but it gets even more challenging with art-inspired written projects. This requires a lot of creativity, and it's not easy when you can't view the paintings in person. Google Art Project makes that part easier by providing you with huge amounts of information that can be used for your art papers, as well as an ability to see any piece of art you need for the project.

### 9. Paper

Paper is a drawing and painting app that enables its users to develop their own sketchbooks in a realistic manner. The app is pretty comparable to the process of working with physical materials. It offers a wide range of expressive tools that make digital art more beautiful than ever.

### 10. ArtSite

With the help of ArtSite, students

can find valuable information on many important art pieces, which is a feature similar to the Google Art Project. However, ArtSite enables students to organise the materials of their interest and create their own galleries, which will represent their knowledge and taste of art. In addition, ArtSite also enables its users to create portfolios where they will feature their own art.

Thus, you start each autumn with fear of the amount of work your professors will place in front of you. Academic writing is a process that requires a lot of time, experience and effort, but you can start this semester with new ways of making your work more effective, faster and easier. All online sources we listed in this article will make you a better writer by keeping your focus where it should be. In addition, they will save you a lot of time, which means that you will be able to complete all assignments by the deadline and still have time for being a relaxed student who takes part in all campus events.

*Melissa Burns is a student of journalism interested in information technologies, especially in ones in the sphere of education. She is always on the lookout for new tools that aid studying and wants everybody to know about them.*

## How the heart is like a 'little brain': which is really in control?

BY HENRY JOM  
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Modern science has verified what the ancients believed about one's heart – that the heart is a centre of higher wisdom. It can actually remember things and it functions much like the brain.

The heart's structure is similar to that of the brain: it has an intricate network of neurons, neurotransmitters, proteins and support cells.

"There is a brain in the heart, metaphorically speaking," said Dr Rollin McCraty of the HeartMath Institute, a non-profit that offers treatments based on the connection between heart and brain. "The heart contains neurons and ganglia that have the same function as those of the brain, such as memory. It's an

anatomical fact," he said.

"What people don't know that well is that the heart actually sends more information to the brain [than the brain does to the heart]," he added.

Dr J. Andrew Armour coined the term "heart brain" in 1991; he has also called the heart a "little brain".

According to Harvard Medical School, chemical "conversations" between the heart and the brain affect both organs. Depression, stress, loneliness, a positive outlook and other psychosocial factors influence the heart. The health of the heart can also affect the brain and the mind.

As neuro-cardiology (the study of the brain and heart connection) has developed, researchers have found that negative emotions throw both heart rhythms and brainwave patterns out of

sync.

Stress responses, for example, take a toll on the body, contributing to high blood pressure, the development of artery-clogging plaque, and brain changes that may contribute to anxiety and depression, according to Harvard Medical School.

Conversely, when a person experiences positive emotions, heart rhythms and brainwave patterns are harmonious and coherent.

### Heart as an emotional centre

The heart as an organ is linked to the concept of heart as an emotional centre. The heart sends messages through physical pathways to the brain, which are then interpreted as emotion.

McCraty explained: "Heart beats are similar to morse code, with these messages reflecting



one's emotional state."

McCraty has worked as a psycho-physiologist for nearly 30 years. One technique he works with through the HeartMath Institute is "heart-focused

breathing".

While breathing deeply, the patient directs attention to the heart, which "shifts the physiology and facilitates changes in the body's rhythms", McCraty

said.

Heart and brain wave patterning has been measured to observe the effects of this technique, showing greater coherence.