

# Anthropological analysis of human body emissions using new photographic technologies

A study confirming ancient perceptions in Art History

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**Abstract** — SB Research Group experience in the field of archaeoacoustics has developed over the last few years which includes new research methods that examine the effect sacred sites have on the human brain. One such method builds on experience gained in the forensic field, using extreme UV photography via a prototype camera. New discoveries in neurophysiology have enabled emotional states of a given subject to be measured by recording UV light emitted from the brain. A halo effect was recorded around the head which looked similar to the aureole of saints or glorified people represented in historical paintings. This aureole was found to be larger and stronger in people who were trained to meditation and prayer. This phenomenon is stronger in ancient “sacred” sites too.

**Keywords** - Extreme ultraviolet light, halo, anthropology

## I. INTRODUCTION

Earlier archaeoacoustic and anthropology studies by SB Research Group have demonstrated the human body can be the protagonist of effects originating from ancient places and temples<sup>[1,2,3,4,5,6,7,8,10,11]</sup>. We also demonstrated that some physical phenomena (vibrations, magnetic fields and radio waves) present at such sites, can influence brain activity<sup>[5,7,10,11]</sup>. To analyze altered states of consciousness at particular ancient places, musical instruments or the voice were used to stimulate the resonance whilst volunteers were monitored using electroencealography (EEG)<sup>[5]</sup> or TRV camera<sup>[7,11]</sup>.

During such experiments the EEG determined the difference in electrical activity of the volunteers brain. The TRV camera on the other hand, monitored the emotional state of volunteers by measuring the direct correlation between emotional and functional states of the human body through precise parameters of controlled motion reflection<sup>[7,11]</sup>.



Figure 1. Monitoring the altered state of volunteers consciousness using EEG, Cividale del Friuli Hypogeum, Italy

Throughout the experiment the EEG identified the most active brain<sup>[5]</sup> area, whereas the software connected to the TRV camera enabled states of stress or other levels of biological parameters important for monitoring mental/emotional balance to be analyzed. The stress equation algorithm includes different filters, settings and adjustments which can be configured within the software. In particular by detecting micro-movements on the left and right side of the body in correlation to vibrations in the examined subject<sup>[7,11]</sup>.

In order to confirm previous data a new qualitative and quantitative method in scientific photography was used. This enabled the level of altered states of conscience that can be attained at ancient sacred sites to be further verified.

<sup>1</sup> (\*) Note. SB Research Group (SBRG) is an international and interdisciplinary project team of researchers (Italian, Croatian, English and Finish members) researching in anthropology and archaeoacoustics of ancient sites and temples in Europe (www.sbresearchgoup.eu ).

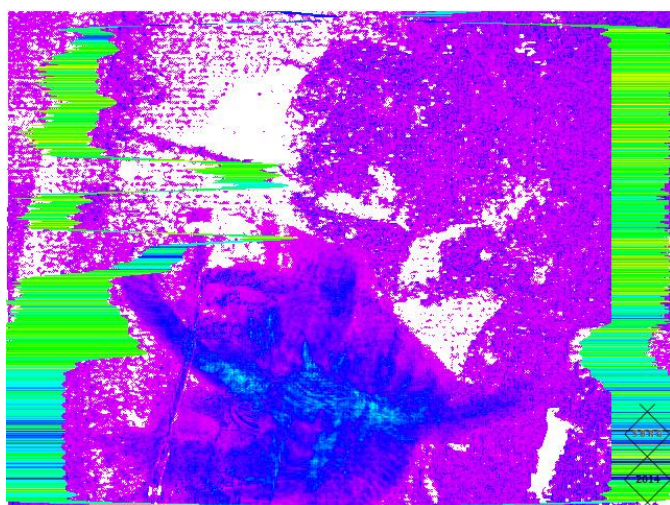
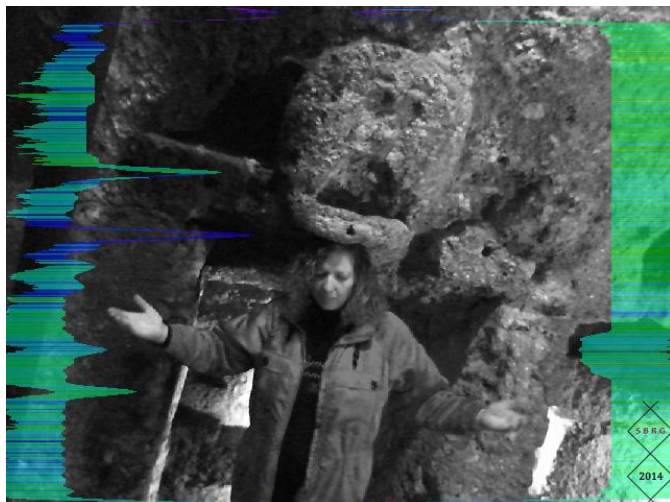


Figure 2. TRV camera images taken inside Cividale del Friuli Hypogeum

Based on research by J. N. Hansen and J.A.Lieberman <sup>[14]</sup> which shows the human body can emit non-visible light (extreme UV emissions) from the microtubules of neurons at specific levels of consciousness, appearing in many ways as a glow of light around the head <sup>[14]</sup>, it was decided to utilize this aspect of research in archaeoacoustics. A particular digital camera with a very sensitive sensor, based on military technology, was built to not only perceive visible light, but also ultraviolet rays in the extreme UV and IR band.

## II. SCIENTIFIC BACKGROUND OF THE CAMERA

With quantum vibrations increasing in importance, the world of physics has been fast approaching the arena of neuroscience offering an alternative perspective. The aim was to build on earlier archaeoacoustic research to investigate the relevance of conscious studies from the Microtubule Neurological System (MNS) perspective along with other related biological materials. Neurophysiologists have neglected to consider materials beyond the neuron considering them only as particular cells. However recent discoveries within the MNS

field have shown that proteins and other brain materials, (as the discovery of a resonance chain that connects DNA to the brains final architecture) make it possible to better understand brain activity. In particular the recent discovery of a resonance chain that covers an astonishing frequency bandwidth of several orders of magnitude within the brain, could bring neurophysiologists and consciousness researchers to a unified approach to better understand brain responses <sup>[17]</sup>.

Further, the discovery by Hameroff and Penrose <sup>[13,17]</sup> of quantum vibrations in the microtubule architecture located within the cerebral cells influenced this research. They proposed that brain waves recorded by electro encephalography (EEG) originate from the vibrations of the brain neurons microtubule structure. Furthermore treating brain microtubule vibrations could benefit a host of mental, neurological, and cognitive conditions. Penrose and Hameroff consider that also thoughts could originate from this system and quantum vibrations are orchestrated by synaptic connections (Orchestrated Objective Reduction or "Orch OR" theory) <sup>[13]</sup>.

This theory was initially highly criticised because many researchers considered the brain too complicated to host delicate quantic processes. But recently Orch OR theory was confirmed by Anirban Bandyopadhyay's research group with the Intistute of Science of Materials in Tsukuba (Japan) <sup>[18, 19]</sup> and by Eckenhoff's team <sup>[12, 17]</sup> from the University of Pennsylvania. In particular the latter research demonstrated that general anestesia can act on the neuron microtule system without interfering with other cells functions, thereby operating on the conscience without influencing non-conscience brain functions. Moreover, brain memory is now considered a deformation of the resonance chain.

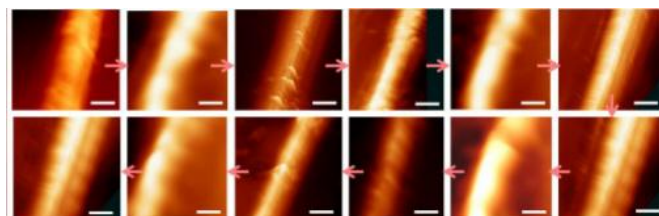


Figure 3. Different aspect of microtubules during resonance (from Adventure Consciousness Conference, 16th January 2014, Amsterdam, Netherlands) <sup>[17]</sup>



Penrose, Hameroff and Bandyopadhyay explored their theories during a session on "Microtubules and the Big Consciousness Debate" at the Brainstorm Sessions, a public three-day event at the Brakke Grond in Amsterdam (Netherlands) January 16-18, 2014<sup>[17]</sup> and concluded that "Consciousness depends on anharmonic vibrations of microtubules inside neurons, similar to certain kinds of Indian music, but unlike Western music which is harmonic vibration" (Hameroff)<sup>[17]</sup>. Further they found resonance vibrations not only generate electric activity (as detected by EEG) but also light. This could explain how people with an elevated consciousness such as the saints of old are depicted in paintings with a aureole around their heads. Is there perhaps anything more scientific that can be found in this anthropological tradition that in some way links to the new discoveries in neurophysiology? If this aurea was visible to an artist capable of perceiving weak chromatic variations of light, this could perhaps inspire generations of artists. This could offer one possible explanation as to the so-called "third eye" as described in oriental philosophy.

Our camera was capable of capturing images beyond visible light, into the visionary domain of reputed gurus and yoga masters. Whilst at the same time enabling quantitative exploration of levels of consciousness of volunteers throughout the archaeoacoustic experiments at ancient sites.

### III. MATERIALS AND METHODS

Our special camera (we named it "FUTURA") comes out from the idea of our researcher, Daniele Gullà, who projected this device on the base of his great experience in legal analysis of scene of crime for Italian police and as expert appointed by the judge in Italian courts and in cyber crime. In forensic field and also in anthropology the research in ultraviolet band gives a lot information normally not visible by human eye<sup>[9]</sup>, but it has not explored sufficiently in extreme UV band.

So for our camera it was chosen a very high sensitive sensor, normally used for Scientific and Medical Imaging and Microscopy. This is the CCD42-40 NIMO CCD sensor with back illuminated format for high quantum efficiency by English E2V Factory. It has full-frame architecture, 2048 by 2048 pixel format of 13.5  $\mu\text{m}$  square pixels. Back illumination technology, in combination with extremely low noise amplifiers, makes the device well suited to the most demanding applications requiring a high dynamic range. To improve the sensitivity further, the CCD is manufactured without anti-blooming structures. There are two low noise amplifiers in the read out register, one at each end. Charge can be made to transfer through either or both amplifiers by making the appropriate R1 connections. The readout register has a gate controlled dump drain to allow fast dumping of unwanted data. The register is designed to accommodate four image pixels of charge and a summing well is provided capable of holding six image pixels of charge. The output amplifier has a feature to enable the responsivity to be reduced, allowing the reading of such large charge packets.

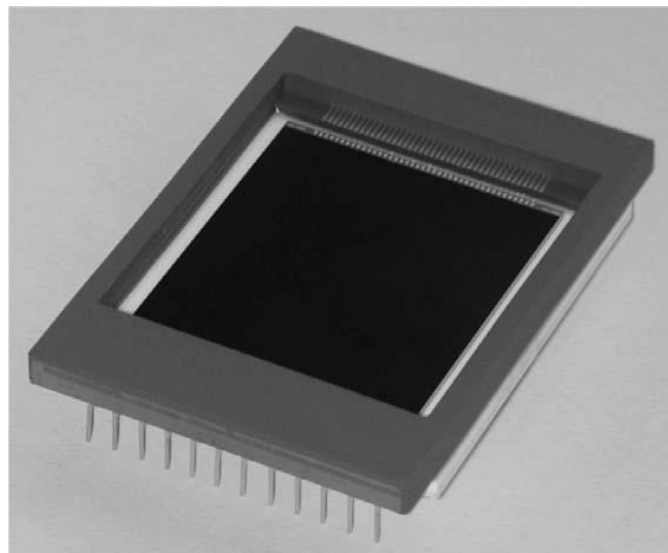


Figure 4. The CCD42-40 NIMO back illuminated CCD sensor by Canadian E2V sensor

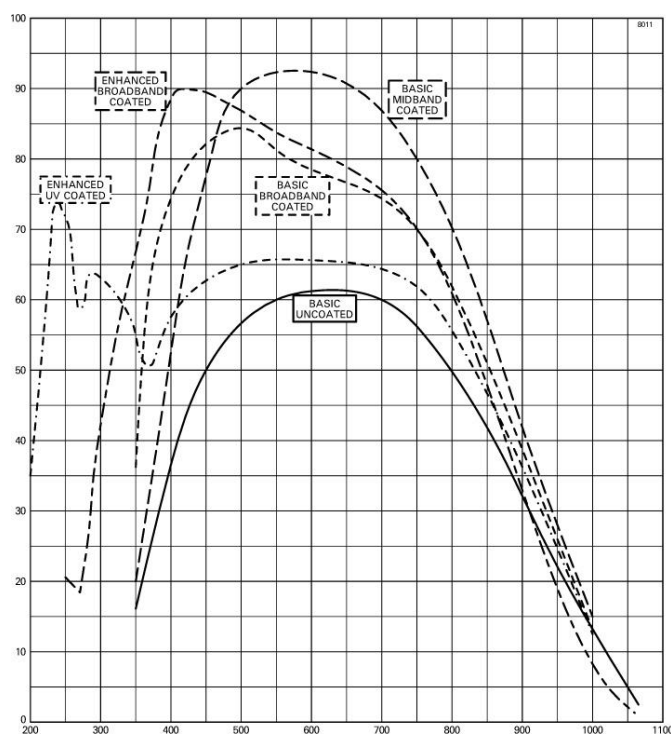


Figure 5. Typical spectral response of CCD42-40 NIMO sensor. On abscissa axis the wavelength in nm, on ordinate axis the quantum efficiency in %

Because in extreme ultraviolet band (UV) the absorption of lenses of normal optics is very strong, usually a normal optic is unable to allow electromagnetic waves below 320-350nm to pass through, we needed scientific optics for our camera. Optics with calcium fluoride and quartz lenses for forensic use (200-1.300nm) were chosen and in particular a Cerco 2073 "UV lens" optic, designed for intensified CCD video cameras with UV photocathode (diameter 18 or 25 mm). This lens

allows 200nm of UV light to pass through at 85%, so the attenuation in extreme UV band is really low. This UV optic achieves the best luminous efficiency for ultraviolet imaging, thanks to its F/1.8 aperture and multilayer antireflective coatings.



Figure 6. Cerco 2073 UV lens

The main characteristic of the TRV camera is its multispectral extension over standard photographic cameras. Inside the cameras box is a disk upon which are fitted eight filters encompassing a number of ultraviolet, visible light and infrared pass bands. This disk rotates in front of the sensor enabling rapid changing of filters without the need to move the camera or optics. It is therefore possible to choose a specific light band to analyze and if the camera is placed on a tripod, the researcher can choose the bands he wants to examine enabling a number of different images to be captured on the same photograph, or on separate photographs to enable comparison of the different results.

TABLE I. FILTERS AVAILABLE FOR MULTISPECTRAL IMAGES

No. Filters	Type of filters inserted in the multispectral camera		
	Filter passband	nm	Extension band
F 1	Empty, for all spectrum		
F 2	Extreme UV	220	50
F 3	UV	250	50
F 4	UV	300	50
F 5	UV	350	50
F 6	Visible light	514	10
F 7	IR	850	50
F 8	IR	950	50



Figure 7. The external aspect of the multispectral camera FUTURA built by D.Gullà

The multispectral camera also has an active beryllium filter on the sensor, when this filter is activated the camera can only photograph X-rays, gamma rays, cosmic rays and neutrons. The camera is portable as it has an internal battery with a TFT screen. The CCD with microcells of Peltier has a self cooling to -60°C. The downside of this sophisticated device is that it weights almost 3.2 kg and can only be used on a tripod. This camera can be extended also in other fields of archaeology, for example in rock-painting, art restoration and deteriorated manuscript.

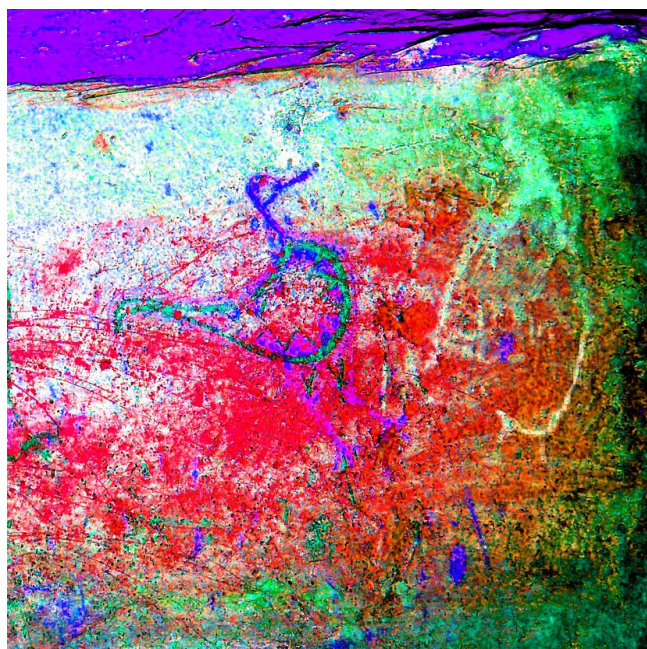


Figure 8. A hidden rock painting in a Etruscan tomb in Veio (Italy) taken in multispectral mode by TRV camera



#### IV. RESULTS

We tested 10 volunteers and observed that human light emissions resulting from the vibrations of the neuron microtubule system are only visible in the UV band. Usually images taken in the UV band have the appearance of black and white photographs, to more easily distinguish between different UV light bands, coloured images were developed. Images of the emissions around the human body were set up using a three band (F3, F4, F5) RGB composition (Table 1). The coloured images were set up in three coloured bands: the BLUE colour was taken by F3 filter until 250nm, the GREEN colour by F4 filter until 300 nm and the RED colour by F5 filter until 350nm. Over the red band at 350nm, it was not possible to see any light emission around the volunteer.



Figure 9. A 'halo' around the head of a volunteer during meditation in an ancient sacred site in the UV band. This light emission is also evident during deep meditation in trained people

All these images are original, free from interpolation or modification and do not appear to be an artifact from this technique. Such emissions are more visible in people who have practiced meditation or yoga for several years, where it is possible to find a larger halo around their heads. As in other our EEG research <sup>[5]</sup>, brain activity reacts differently if the volunteer is regularly practicing meditation or prayer<sup>[5]</sup>, whereby the halo surrounding the head is more expanded. It is important to point out the TRV camera's sensor directly reads the light emitted from the subjects head without any stratagem to highlight the halo.

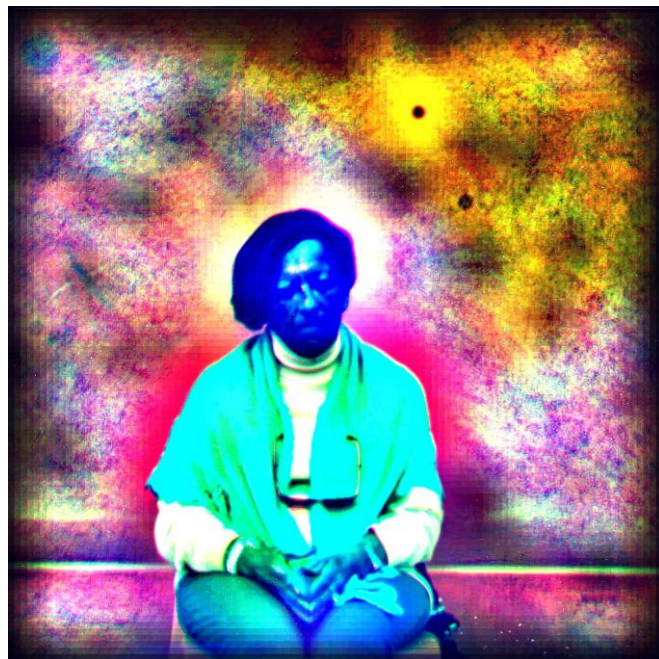


Figure 10. An RGB image of the same subject as Fig.8 which highlights the different frequencies around the human body: the white colour around the head shows light emissions from all UV bands



Figure 11. It is evident the light around the head during deep meditation in a sacred site



Figure 12. Several volunteers were photographed. The difference of their halo around the head was very evident.

The second important result is the fact that in sacred sites this halo is easily expanded after a permanence of some minutes, as the environment could have a direct effect on the emotionality of the volunteer or is able to reinforce his capability. This results were all repeatable, also if our results need to expand the number of trial samples from 10 to a larger number of volunteers. But we are not the first researchers who found this halo, also other researchers found it by various sophisticated equipment <sup>[15]</sup>.

## V. DISCUSSION

The observed halo aspect around the head appears to be very similar to the aureole around the head of saints or glorified people as shown in historic paintings. An aureole is the radiance of a luminous halo which surrounds the whole figure. In Christian art it first appeared in the 5th century, however a similar motif is also depicted in pre-Christian Hellenistic art <sup>[16]</sup>. It is found in some Persian representations of kings and gods, the Buddha in Greco-Buddhist art from the 1st century AD. Its use has also been traced through the Egyptians to the ancient Greeks and Romans. In Islamic tradition the Prophet Mohammed cannot be represented; however some religious artists have indicated his presence in historical scenes using an empty, flaming aureole.

Given that saints of several religions through different ages are similarly depicted, the interesting question is it possible that some people are able to see this aureole by their naked eye? This is possible in theory, because the UV light emitted by

human brain is not too far away (350nm) from the visible band (400nm) as this study shows in the RGB implementation of UV emissions (see Fig. 10). It is worth considering with the sense of hearing, some people are able to listen beyond 20KHz, which is just beyond the audible hearing frequencies especially in ancient times when the maximum of noise was a thunder or a big water fall and there were not too strong nowadays sounds as rock music, cinema and traffic which can ruin our organ of hearing from childhood. So it is possible that people were able to see this halo by their own eyes in ancient times, because without televisions or computer screens which have for sure a bad effect on our vision. Obviously we are only in the field of conjecture without evidences.



Figure 13. An ancient picture of Saint Francis

But saints from all over the world probably had a level of spirituality and consciousness elevated along with a behavior related to strong wisdom so we can inscribe them in our sample of “trained” people who presented a large halo under UV photography. So the common anthropologic interpretation of the glorified saint being identified with the sun and represented in the sun's image as a symbol of consciousness and wisdom, might be incorrect. It is possible however, that beyond such ethic opinions, the origins of this tradition come from recording a real phenomena of the glorified person. Given that this tradition is found in many different religions, surely it cannot be purely by coincidence.





Figure 14. An interesting halo over one of our volunteers similar to a flame.

## VI. CONCLUSION

UV photography is a well known method in forensic imaging and in body emissions research<sup>[15]</sup>. It could equally be used to evaluate altered states of consciousness and to describe the variation of induced emotional states or brain activity found at specific ancient sites: for example originating from the effect of sound resonances on the human body or from physical phenomena also found at some sacred sites<sup>[1,2,3,4,5,6,7,8,10,11]</sup>. The unexpected result of people having a halo around the head like in religious iconography looks amazing and appears confirming as the science and the religions often are two different way for describing the same phenomena. Especially when the quantum physics is involved.

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