

Ecological research for scientific, intercultural and interreligious dialogue:

trees for our future

Aldo Winkler

aldo.winkler@inps.it

Religions for Peace

Italia



RELIGION and ECOLOGY

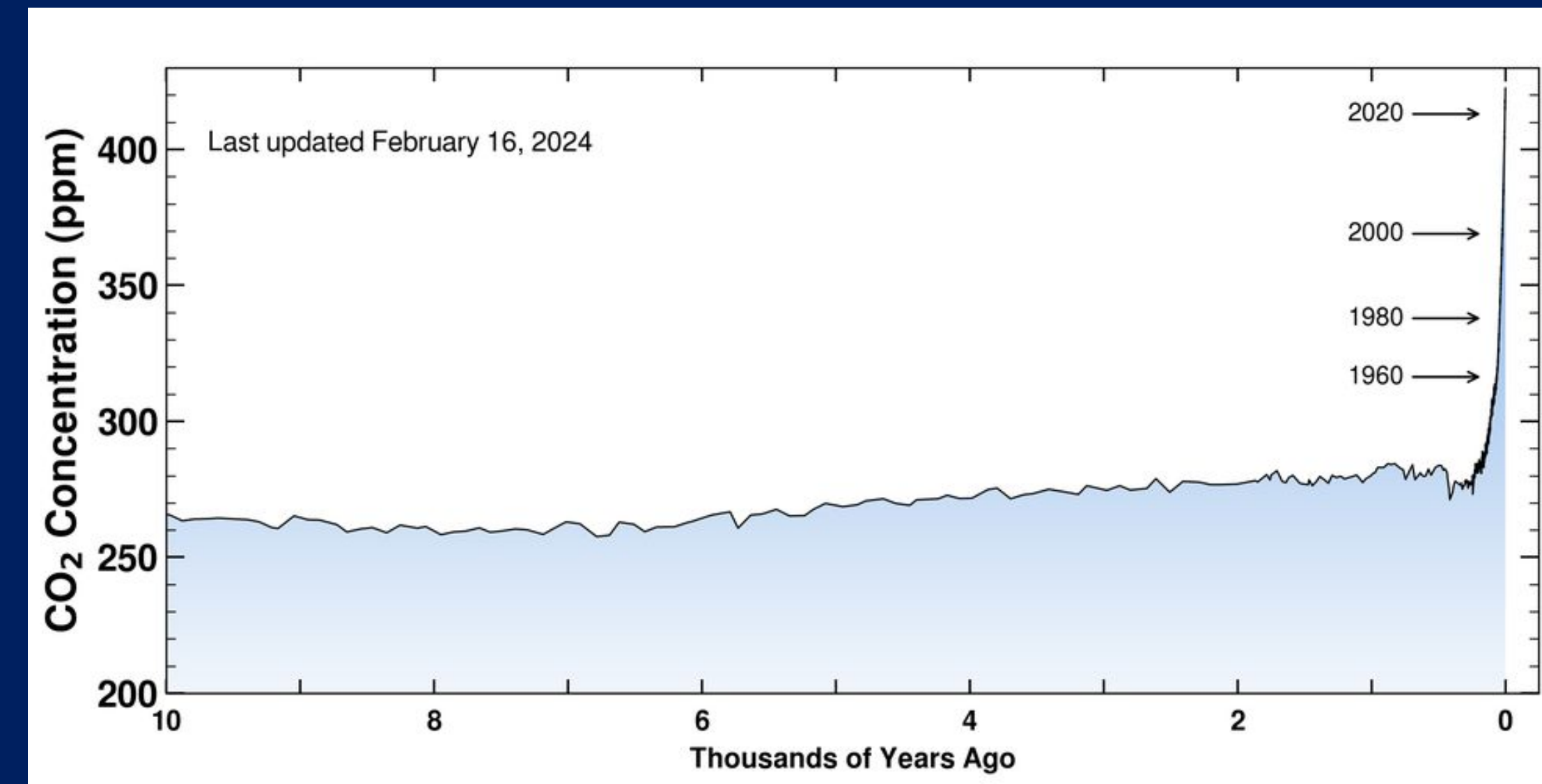
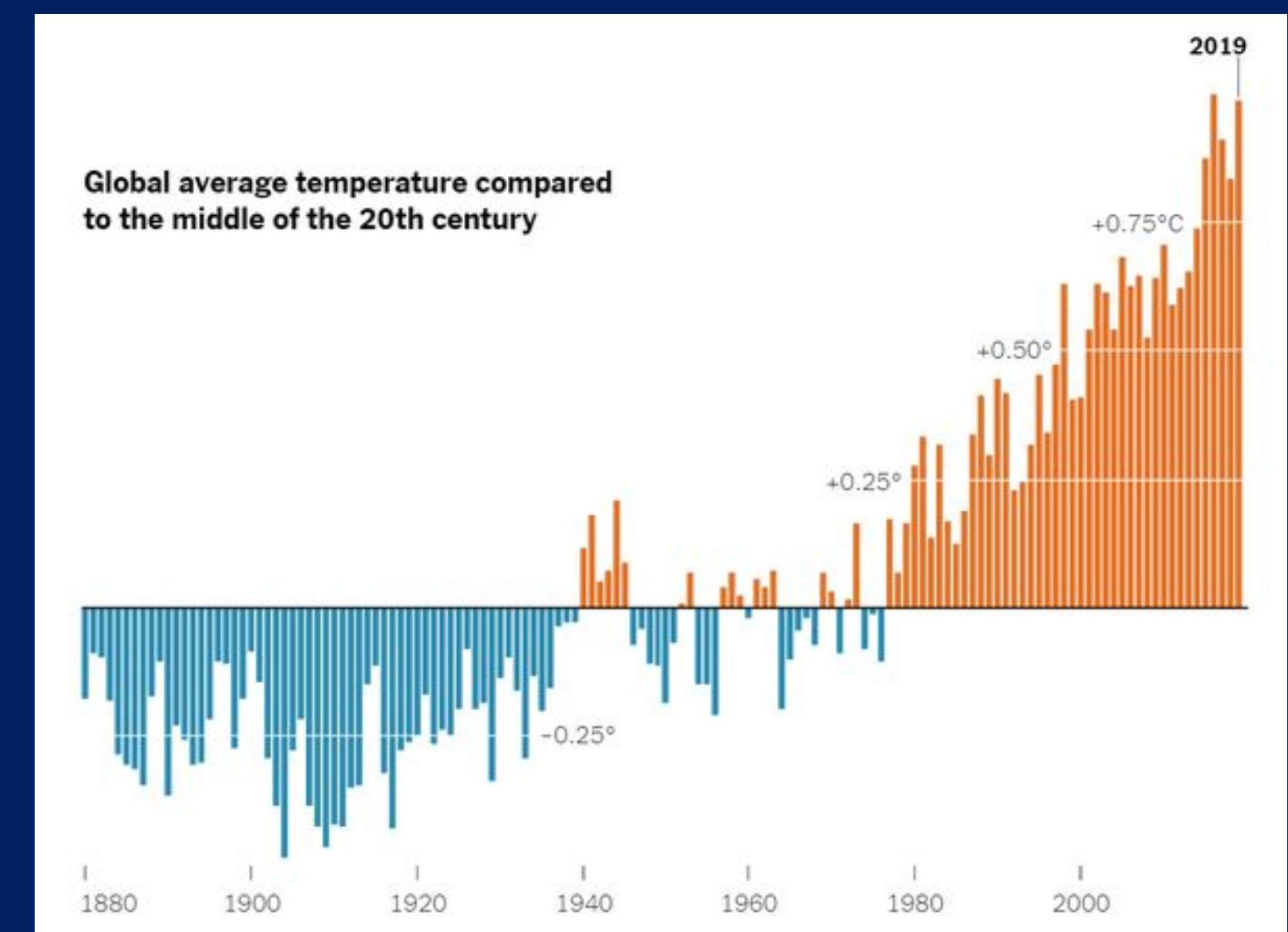
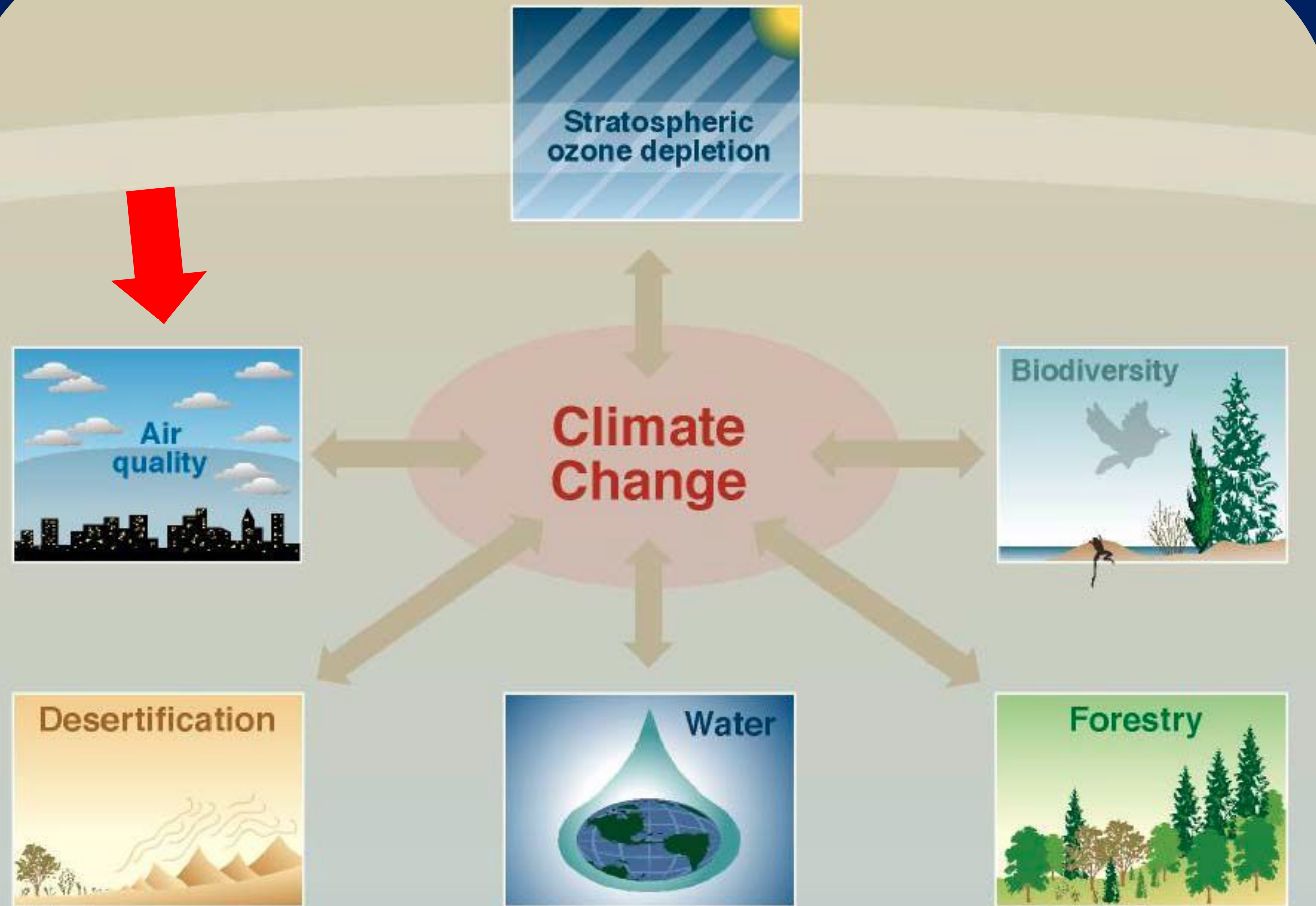


By Krishna, C.P.R. Environmental Education Center



From <https://www.bworldonline.com/opinion/2022/02/22/431636/can-religion-and-faith-combat-eco-despair/>

Climate change in the Anthropocene



ANTHROPOCENE

- Era in which human beings impact geological processes; in common perception, the Anthropocene is linked to pollution.
- The traces left by erosion, deforestation, heavy metals, pesticides up to the residues of the fallout of the first nuclear denotation of 16 July 1945, but also the diffusion of "technofossils" markers of the passage from the Holocene, the most recent geological epoch, defined at the end of the last glacial phase which affected the northern hemisphere (11,7 kyears)

Our urban environments: the health impact of pollution and particulate matter

Airborne particulate matter is composed of a variety of solid and liquid particles (droplets) of natural and anthropic origin, which can be characterized through appropriate chemical-physical analyses

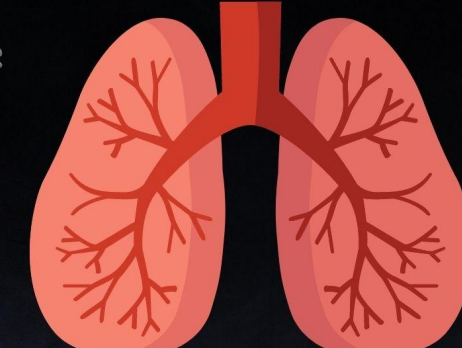
- Dust with a diameter of less than 10 μm (PM10), once inhaled, can reach the respiratory tract and other organs, depending on their particle size
- Industrial and automotive emissions represent the major sources of polluting PM10 of anthropogenic origin.

HEALTH EFFECTS (WHO, 2000)	% increase in the frequency of health effects for a 10 $\mu\text{g}/\text{m}^3$ increase in PM10
Short-term effects	
Cough	3
Decreased lung function in adults compared to average (peak expiratory)	- 13
Increase in hospital admissions for respiratory diseases	0,8
Increase in total daily mortality (excluding accidental deaths)	0,7
Long-term (chronic) effects	
Overall increase in mortality (excluding accidental deaths)	10
Bronchitis	29
Decreased lung function in children compared to average (peak expiratory)	- 1,2


Che impatto ha il PM sulla nostra salute?

In funzione del loro diametro, le polveri sottili si depositano più o meno in profondità nell'apparato respiratorio


Possono determinare infiammazioni acute delle vie respiratorie, crisi di asma, tosse e catarro, diminuzione della capacità polmonare, bronchite cronica, effetti sul sistema cardiovascolare



Le polveri sottili favoriscono inoltre l'insorgenza di ictus, riduzione del flusso sanguigno al cervello, fatale se non trattato immediatamente



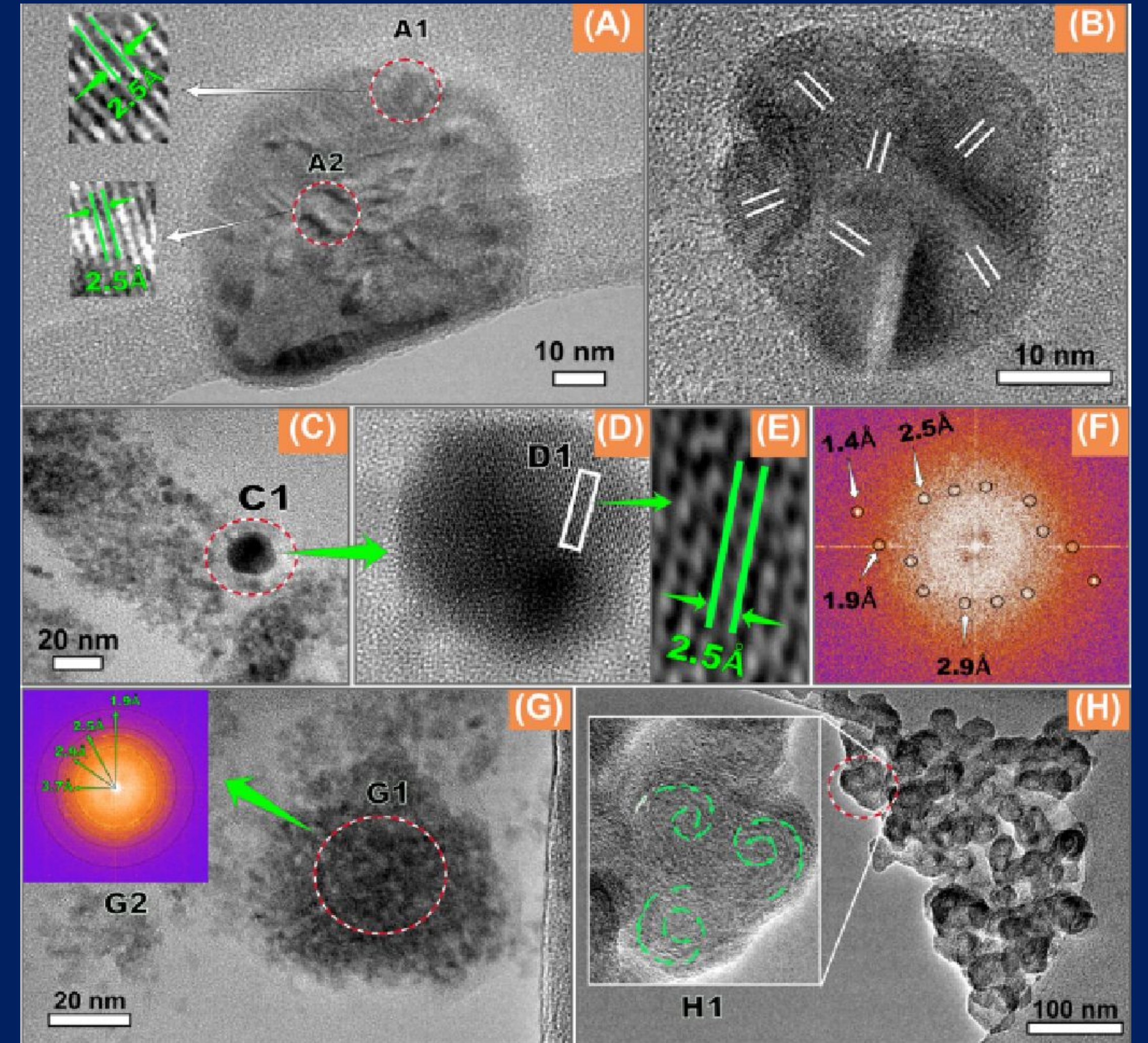
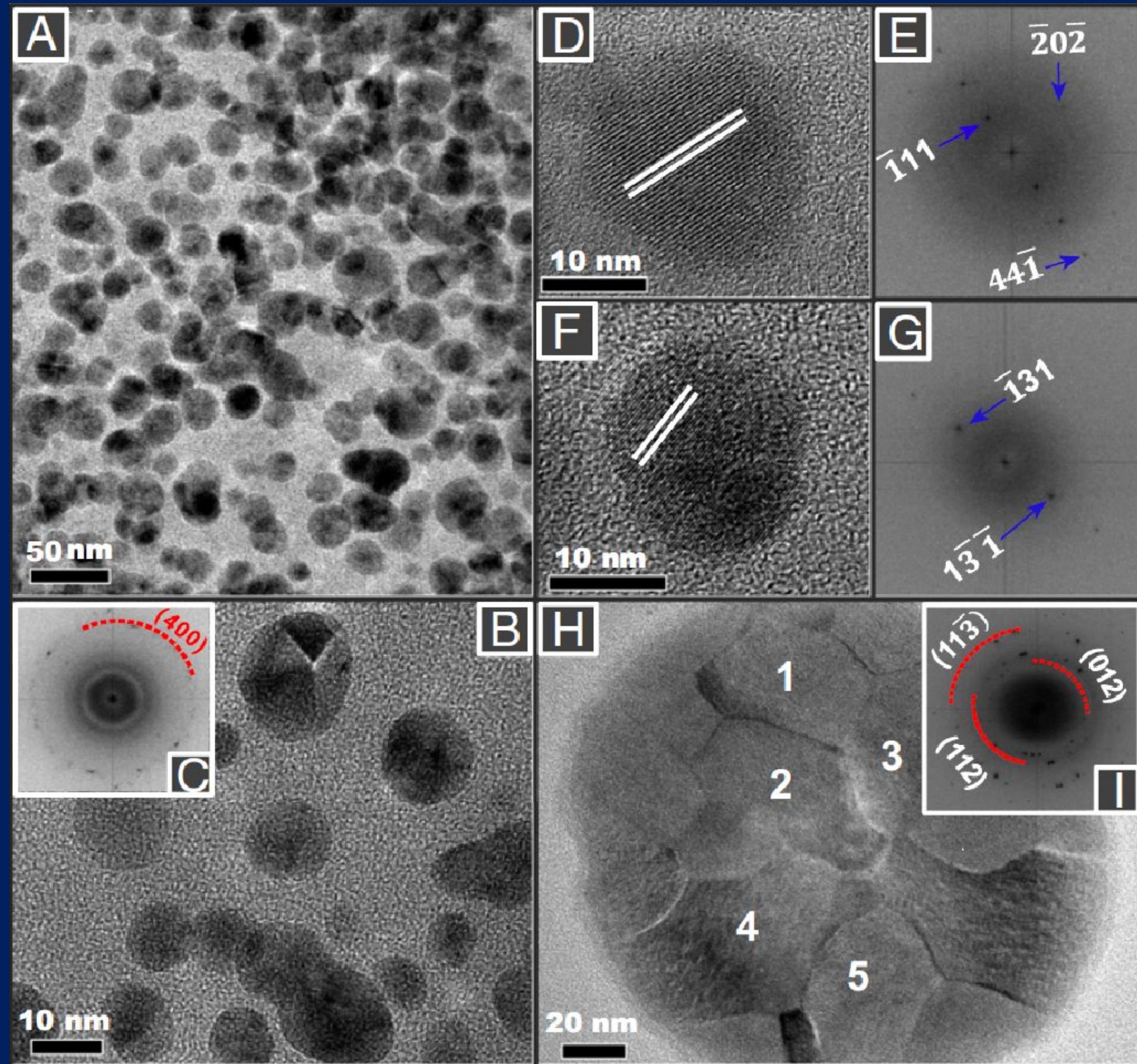
Il PM può causare problemi durante la gravidanza compreso il parto prematuro, basso peso alla nascita



INGV

Ultrafine metallic PM

Alzheimer's and heart diseases: the abundance of magnetic nanoparticles (NPs), very common in urban PM, has recently been linked to Alzheimer's disease (Maher et al., 2016). Exposure to ~22 billion NPs/g of ventricular tissue appears to be directly associated with childhood heart disease in Mexico City (Calderón-Garcidueñas et al., 2019).



TREES FOR THEIR MULTIPLE BENEFITS PROVIDED TO MANKIND

ECOSYSTEM ENVIRONMENTAL REGULATION SERVICES

Tree benefits:

- In Rome, urban greenery removes 1159.90 tonnes/year of PM10
- Reduction of climate-changing gases
- Urban green areas mitigate the "heat island" effect: the average temperature on walls shaded by trees can be reduced by 13-15 °C
- Energy consumption for air conditioning can be reduced by 2.28 kW/die.
- Plants, through photosynthesis, absorb carbon dioxide: in Florence municipal urban green absorb ~72.5 kilotons of CO₂ annually.
- Noise attenuation: a 15-meter tree belt reduces noise levels by 3 dB; Greening a roof would lead to a noise reduction of up to 8 dB.
- Hydrogeological protection: plants, with their roots, hold the soil and contribute to the stability of the slopes.
- Plants make the soil capable of absorbing part of the rainfall, reducing the hydrogeological risk.

Trees and forests in the USA remove 17,106 t/year of pollutants, equivalent to a "value" of \$6.8 billion, corresponding to the "saving" of 850 cases of mortality and 670,000 cases of acute respiratory symptoms

CULTURAL ECOSYSTEM SERVICES

Physical and mental health

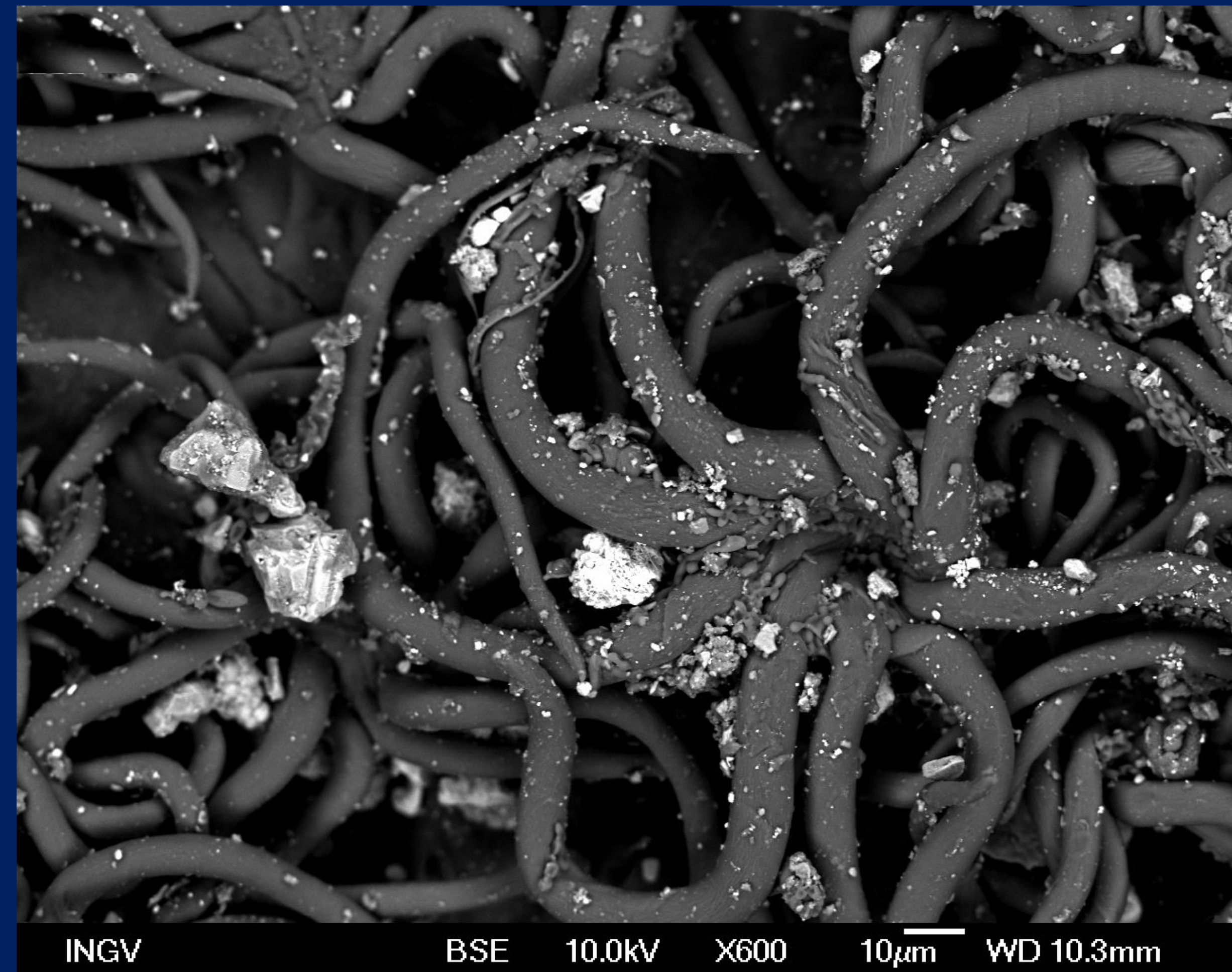
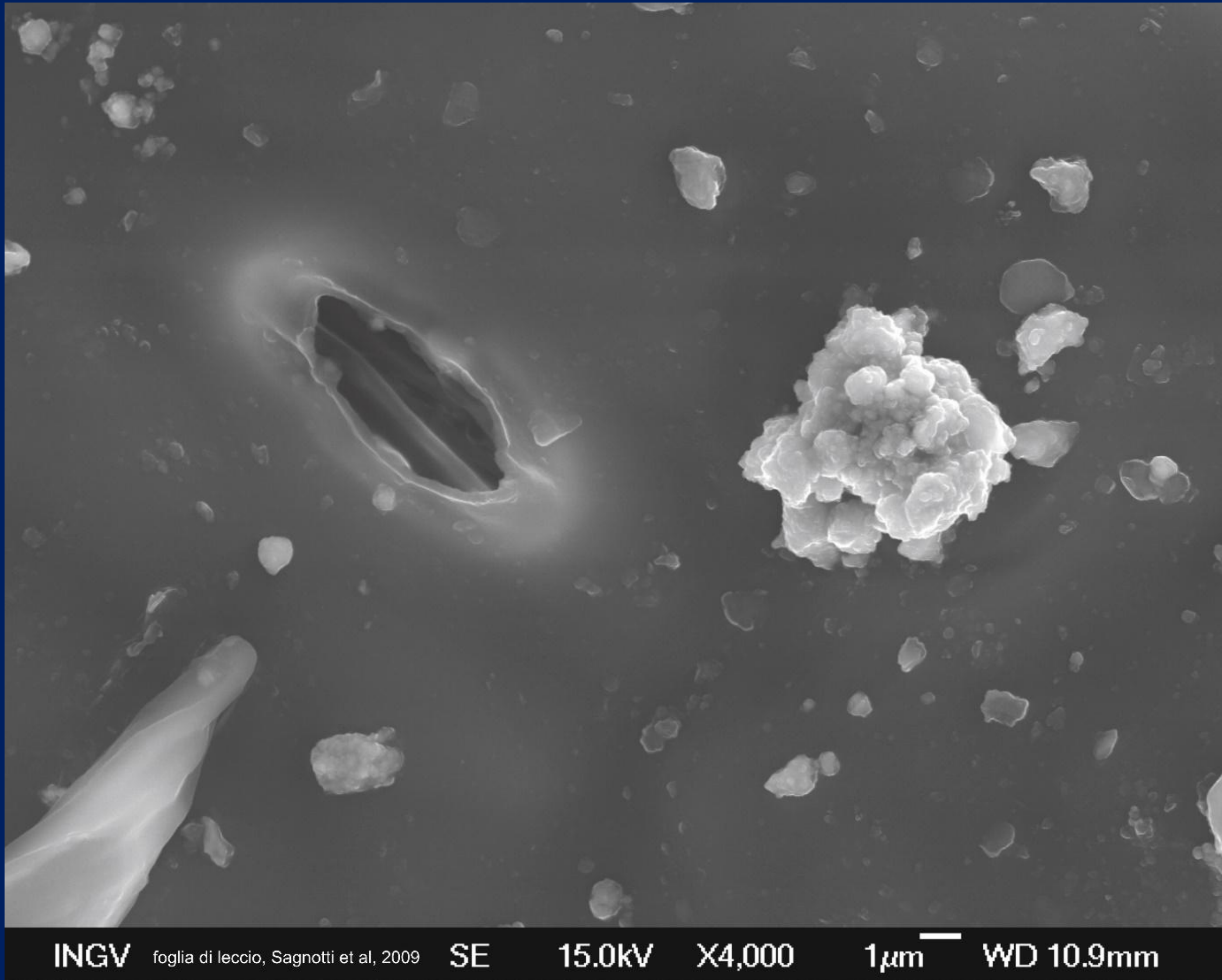
Recreation and ecotourism

Aesthetic values

Spiritual and religious values

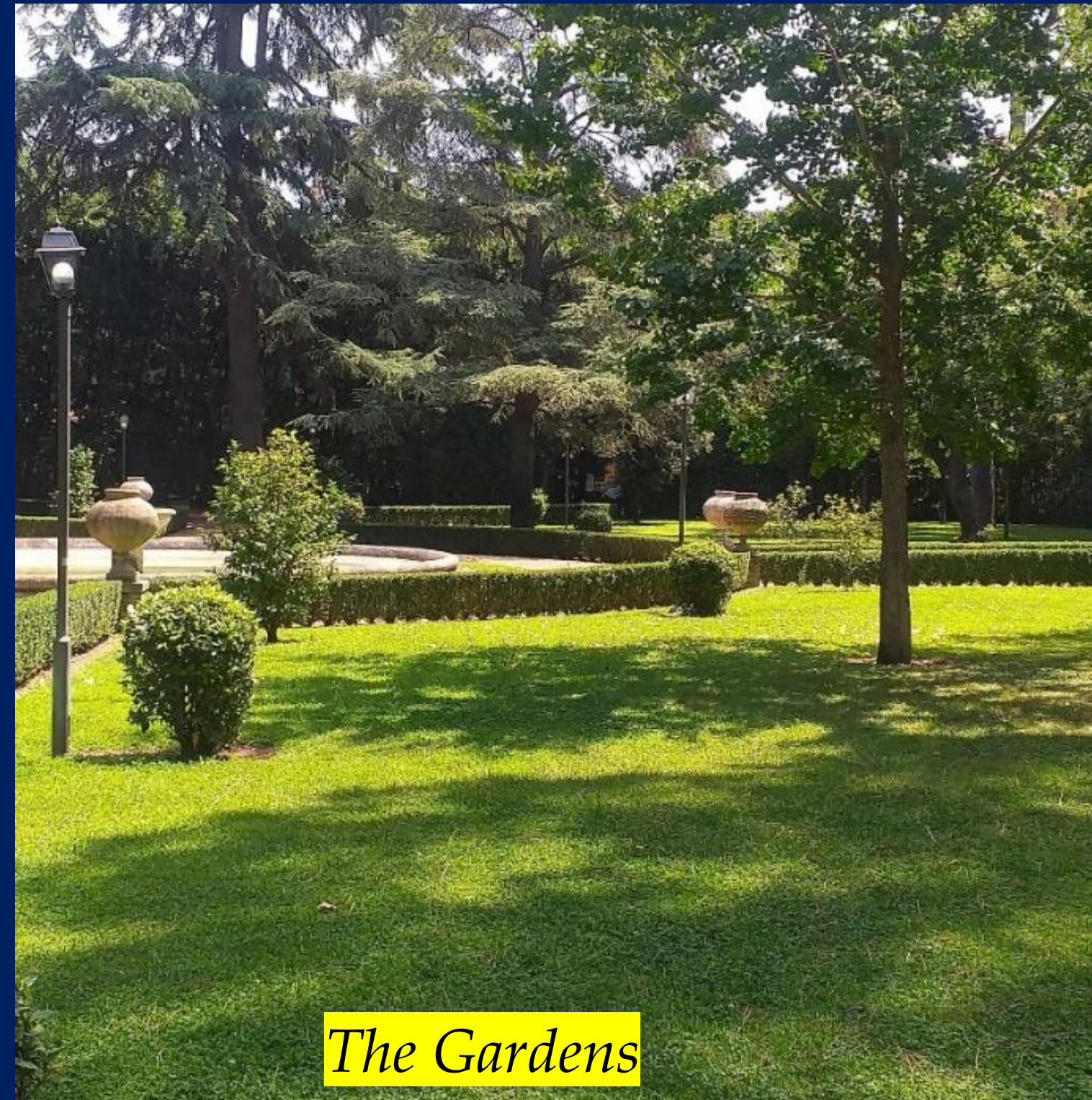


Trees and air quality: metallic particulates accumulated by urban leaves



Metallic particles accumulated by *Quercus Ilex* leaves, Rome

Villa Farnesina: the exposure of Raphael's Frescoes to vehicular PM



- Airborne PM is one of the main causes of degradation of fine arts, damaging their surfaces by different chemical-physical processes.
- Airborne PM deposits on monuments, paintings and masterpieces causes a thick coating that alters their surfaces and compromises their maintenance.

Trees for checking and mitigating the impact of pollution over urban and cultural heritage contexts

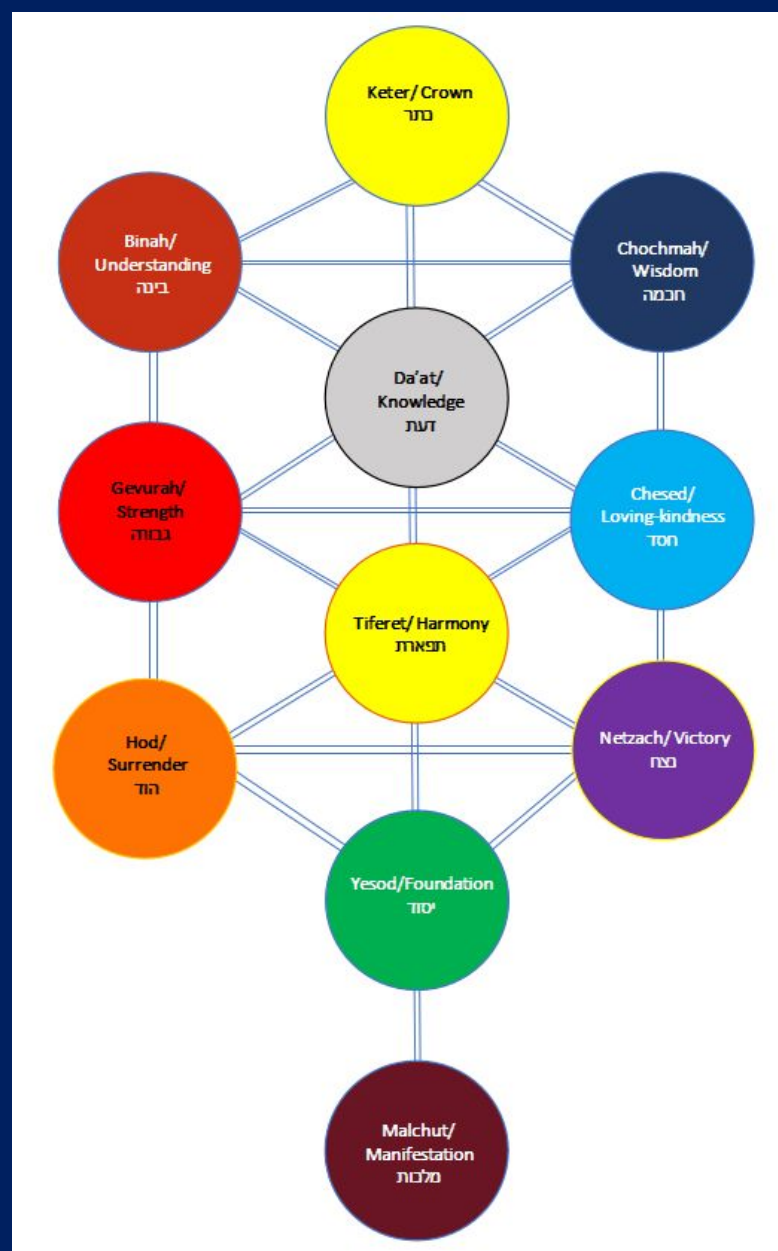


The Loggias of Villa Farnesina, about 30 m from the road, are not significantly influenced by PM, thanks to the combined action of the distance from the road and the preventive ecosystem services provided by trees

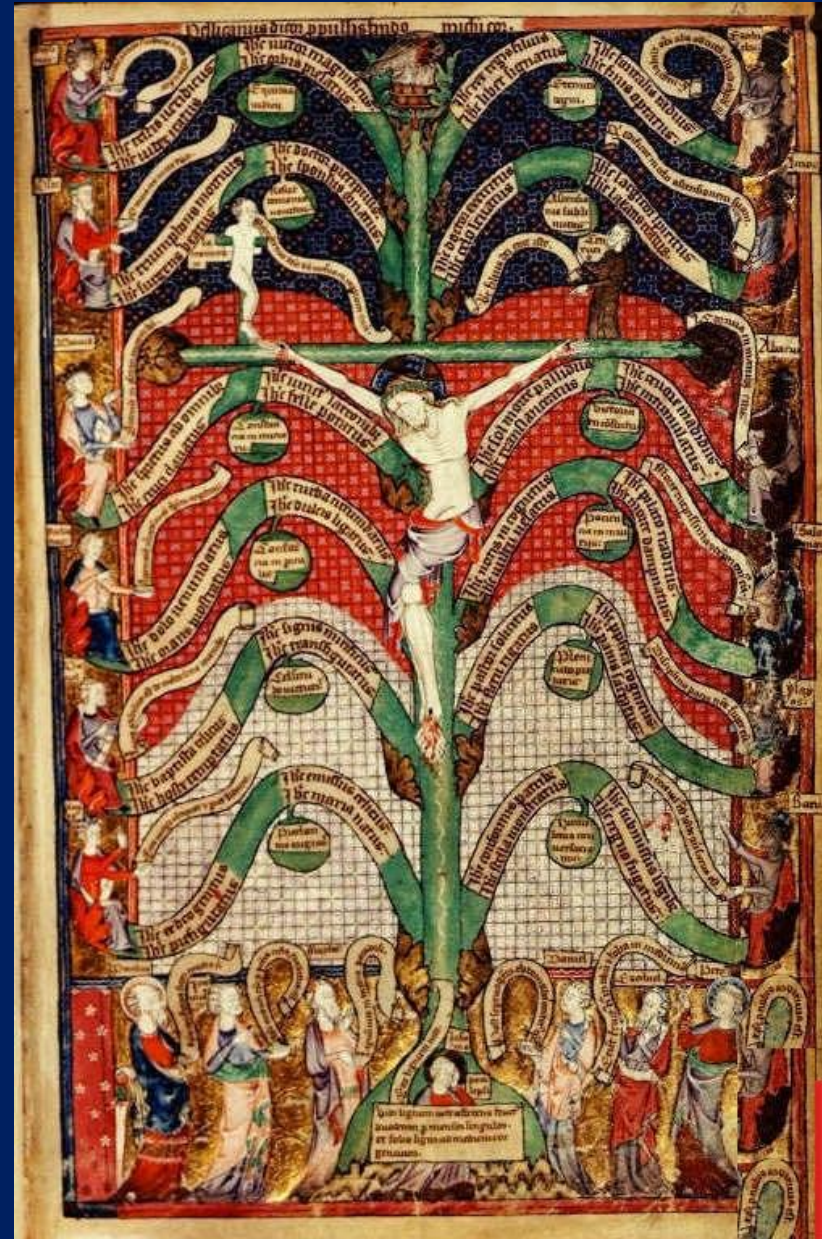


Palatine Hill at the Colosseum Archeological Park; testing the influence of vehicular metallic emissions from Via dei Cerchi towards the Schola Praeconum and the Archeological Area over the Palatine Hill **Sampling of leaves:** *Q. ilex*, *Eleagnus submacrophylla*, *Laurus nobilis*, *Nerium oleander*, *Ligustrum*, *Rhamnus alaternus* and *Olea europea*

Tree: A common scientific, ecological, cultural and religious denominator



- **Judaism:** Judaism has dedicated a holiday to trees, Tu Bishvat, the New Year's Day of the Trees. It is said that, while planting a tree, even if the Messiah is to arrive, one should finish it before welcoming him. The Tree of Life is the synthesis of the main teachings of the Qabbalah, the set of esoteric and mystical teachings of Judaism, and the connection between macrocosm and microcosm, the manifestation of the divine principle in human form.
- **Quran:** Those who believe and do good will rejoice in a flowery meadow (Sura 30:15). In Jannah (paradise) there are rivers of honey and milk and hills of soft moss and saffron. And trees, including the tree of Eternal Life, that has the appearance of a Syrian walnut.
- **Christianity:** the Tree of Life has acquired a symbolic meaning variously associated with Jesus Christ. The tree of life is most commonly considered a symbol of the Cross of Christ; even today in the liturgy of the Exaltation of the Holy Cross, in the preface it is said: «In the tree of the Cross you established the salvation of man, so that from where death arose life would rise again, and whoever gained victory from the tree, from the tree was defeated."



Fourteenth-century depiction of the Tree of Life as a crucifix

Ecology for the dialogue between science, culture and religion

L'ecologia dell'anima

I valori ambientali dei monoteismi europei: Ebraismo, Cristianesimo, Islam

a cura di Antonella Castelnuovo



September 10th, 2024: Meeting at the Chamber of Deputies to present a volume on environmentalism for interreligious dialogue



Sorgente di vita

L'ecologia dell'anima - 06/04/2025

St 2024/25 7 min

Una mattina di primavera al Parco della Caffarella: lezione all'aperto per gli studenti del Liceo Joyce di Ariccia, una classe pilota che partecipa ad un progetto che si intitola "L'ecologia dell'anima. I valori ambientali nei tre monoteismi europei: Ebraismo Cristianesimo e Islam". Il presupposto è che tutte le religioni sono dei sistemi educativi e quindi mirano al benessere dell'uomo nel proprio ambiente. Per un giorno gli studenti sperimentano, tra natura e cultura, il paesaggio, gli alberi, gli animali, ma anche il fenomeno dell'inquinamento ambientale, con un esperimento sulle polveri sottili trattenute dalle foglie.

Vai al titolo Condividi

Israel and the Middle East

Environment as a way for building peace

- Today, Israel is the only semi-arid country with surplus water, making it a technology hub for water-related technologies and for the mitigation the of the desertification.
- Drip irrigation was invented in Israel and is now used all over the world.
- Scalable desalination is increasingly easier to implement, providing 20% of drinking water
- Wastewater treatment is capable of recycling 90% of water (Italy today does so at 5%)
- Israel has a physiological loss of pipes that does not exceed 8% thanks to monitoring and control actions of losses and forecasting of consumption".

Afforestation

Tree planting can reverse desertification as plants create a cycle of nutrients. Israel is the only country over the last 100 years to see a net gain of trees

Green building

Israel builds desert-adapted houses with no conditioning systems, as tested in the Blaustein Institute of the Ben Gurion University of the Negev



Afforestation in semi arid zone: Hiran Forest 1998 (left), 2008 (right)



Wishing for peace, and to return to Earth Care
About 250 million trees have been planted across Israel since 1990. Tree coverage increased from 2% in 1948 to over 9.5% at present.

Environmental Science and sustainable technologies can be a way to promote peace in the Middle East, building bridges of cooperation and agreements for the future of our planet

