

'Pulsed' Corona airtreatment

Bridging the gap



What is at stake?

Les grands épisodes de l'histoire pour la traitement de la pollution de l'air a commencé

Air pollution
Fine dust
Odour
Black-carbon
NO_x
SO_x
Ammonia
Micro-bacteria
VOC

What if there was
"One technology to
treat them all"

What is so special about this technology?

Pulsed Corona technology

Atmos'Fair

25 & 26 septembre 2013

Paris

'Pulsed' Corona airtreatment

Bridging the gap



What is at stake?

Les grands épisodes de l'histoire
pour la traitement de la pollution de l'air
à commencer

Air pollution

Fine dust
Odour
Black-carbon
VOC
NOx
SOx
Ammonia
Micro-bacteria

What if there was
"One technology to
treat them all"

What is so special about this technology?

Pulsed Corona technology

Atmos'Fair

25 & 26 septembre 2013

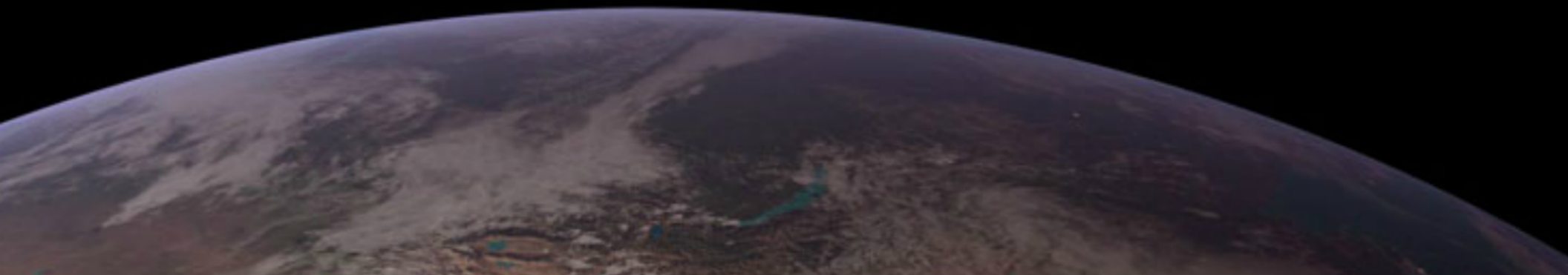
Paris

'Pulsed' Corona airtreatment

Bridging the  gap



Between scientific research and practical applications



What is at stake?





Air pollution

Fine dust

Micro-bacteria

Odour

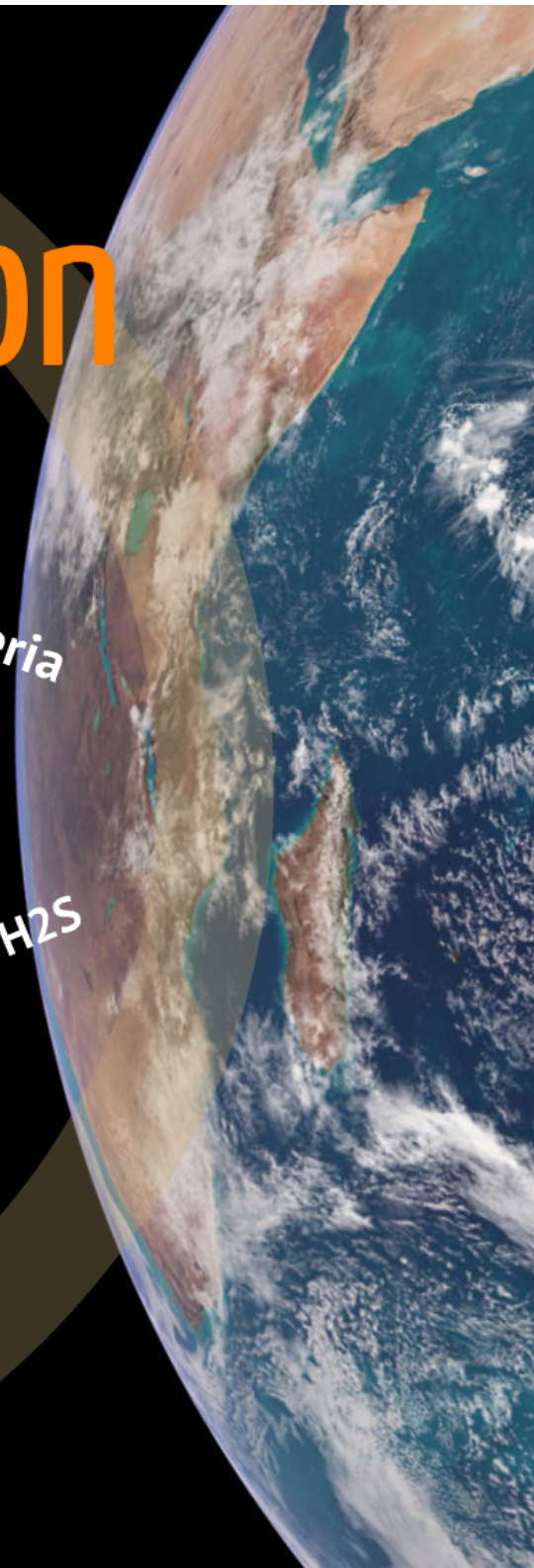
Black-carbon

H₂S

NO_x

Ammonia

SO_x





What if there was

"One technology to
treat them all"

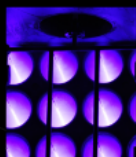
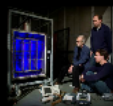
A satellite view of Earth from space, showing a curved horizon. The image features swirling white clouds over a dark blue ocean and a brownish-green landmass. The text "not far from the truth" is overlaid in white.

not far from the truth

Pulsed Corona technology

Also known as
'cold plasma'

Electrical conductivity of air
driven by high overvoltage
without a complete
discharge path



Shower of 'mini' sparks



Chemical reaction

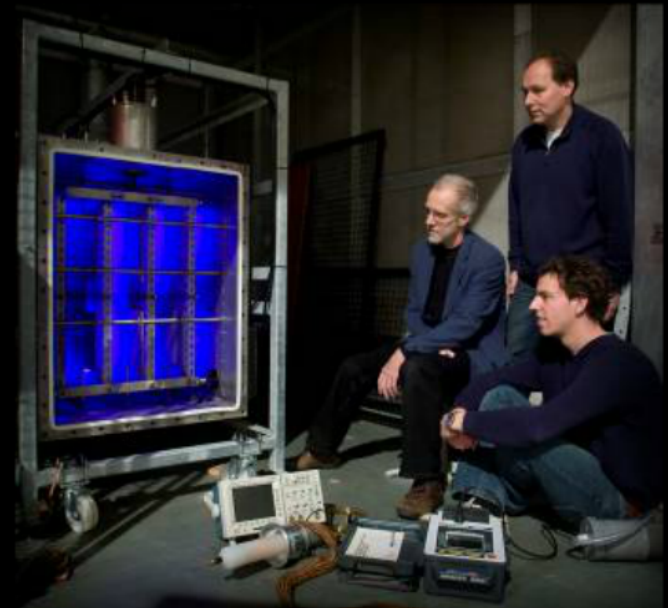
Conversion of pollutants



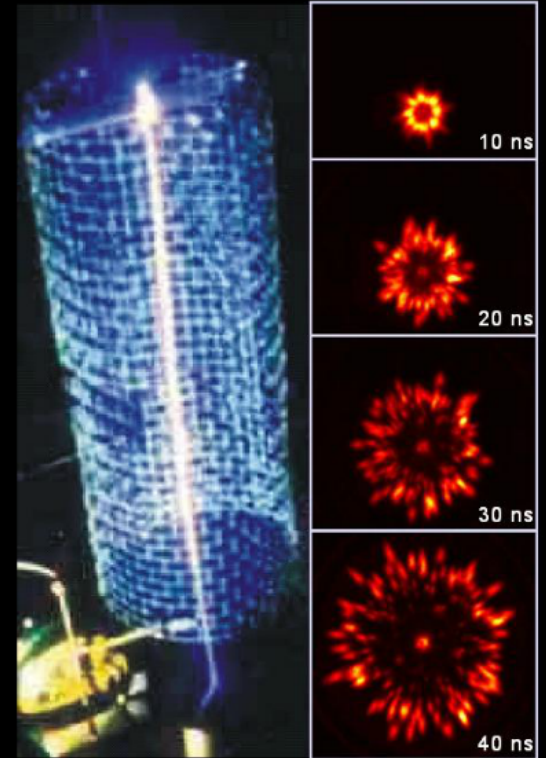
**Also known as
'cold plasma'**



**Electrical conductivity of air
driven by high overvoltage
without a complete
discharge path**



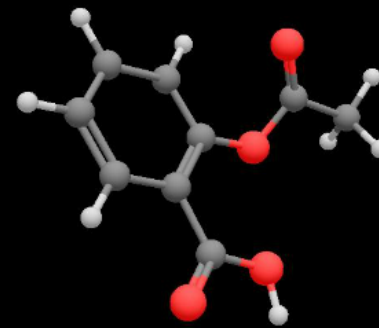
Shower of 'mini sparks'



Chemical reaction

&

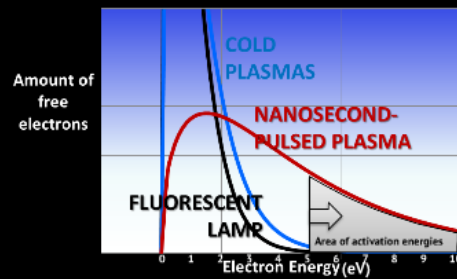
Conversion of pollutants



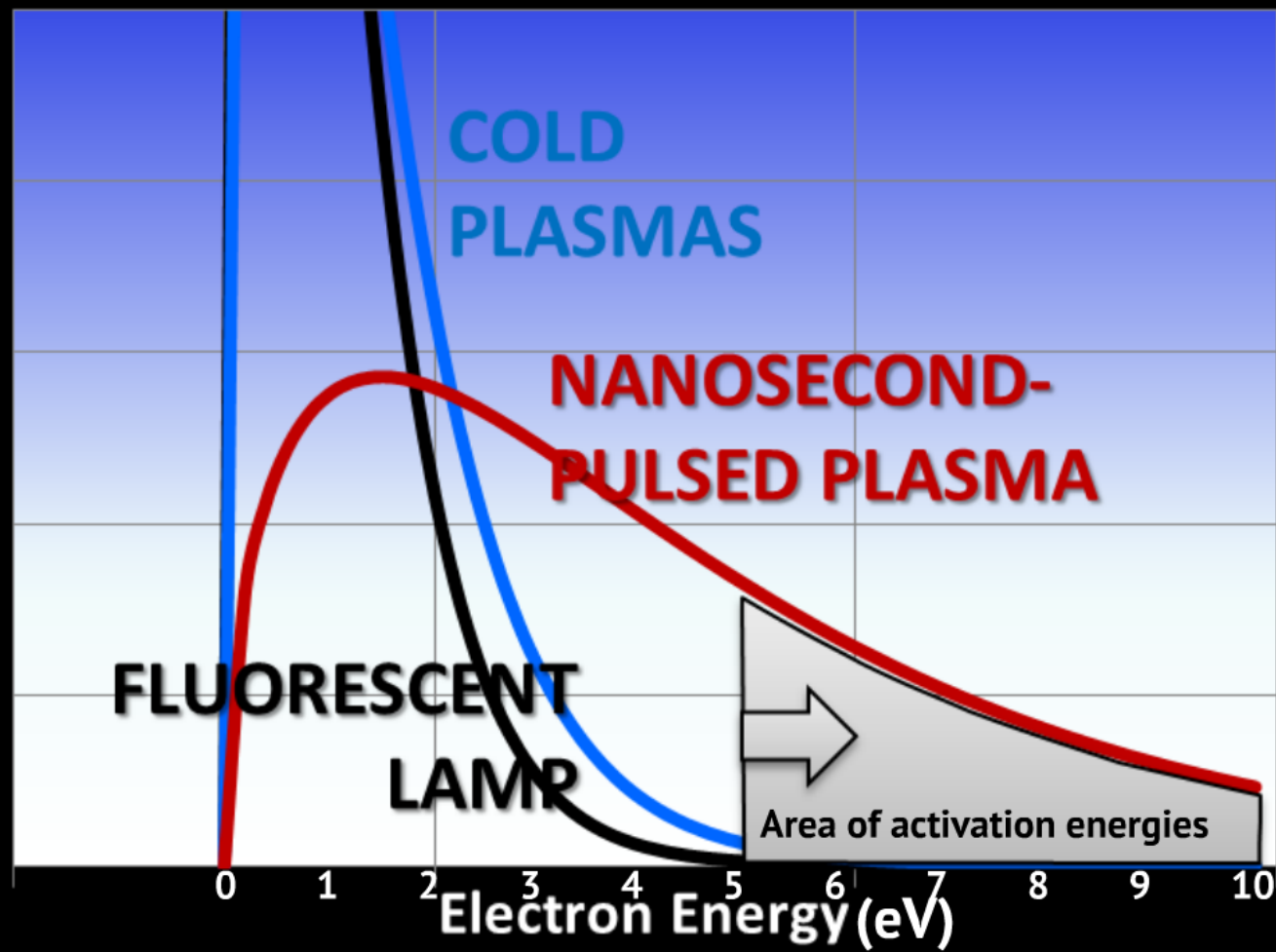
What is so special about this technology?

- overall performance**
 - VOC's: up to 99% reduction
 - NOx: up to 90% reduction
- Zooming in on some of our field pilot tests**
 - Images showing industrial equipment and monitoring screens.
- very little resistance (airflow)**
 - large flows
 - efficient energy use
- can treat a wide variety of contaminants**
 - odour
 - VOC's
 - fine dust
 - H₂S
 - ammonia
 - SO_x
 - NO_x
- very powerful plasma chemistry**
 - Image of a plasma reactor.

very powerful plasma chemistry



Amount of
free
electrons



can treat a wide
variety of **contaminants**

VOC's

micro-bacteria

odour

fine dust

NO_x

black-carbon

H₂S

SO_x

ammonia



large flows

relatively small installation

very little resistance (airflow)

fast reactions

efficiënt energy - use

little residual waste

zooming in on some of our

field pilot tests



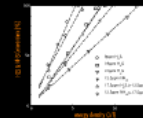
H₂S and NH₃ removal (odour abatement)



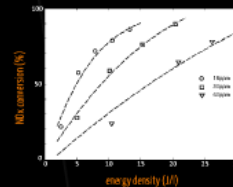
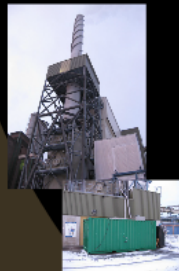
But also @

Food processing plants

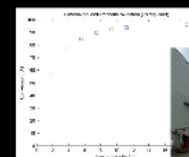
Waste water treatment



80% NO_x removal
(incinerator)



90% Limonene (VOC) removal
(waste drying)



Zooming in on

field pilot tests

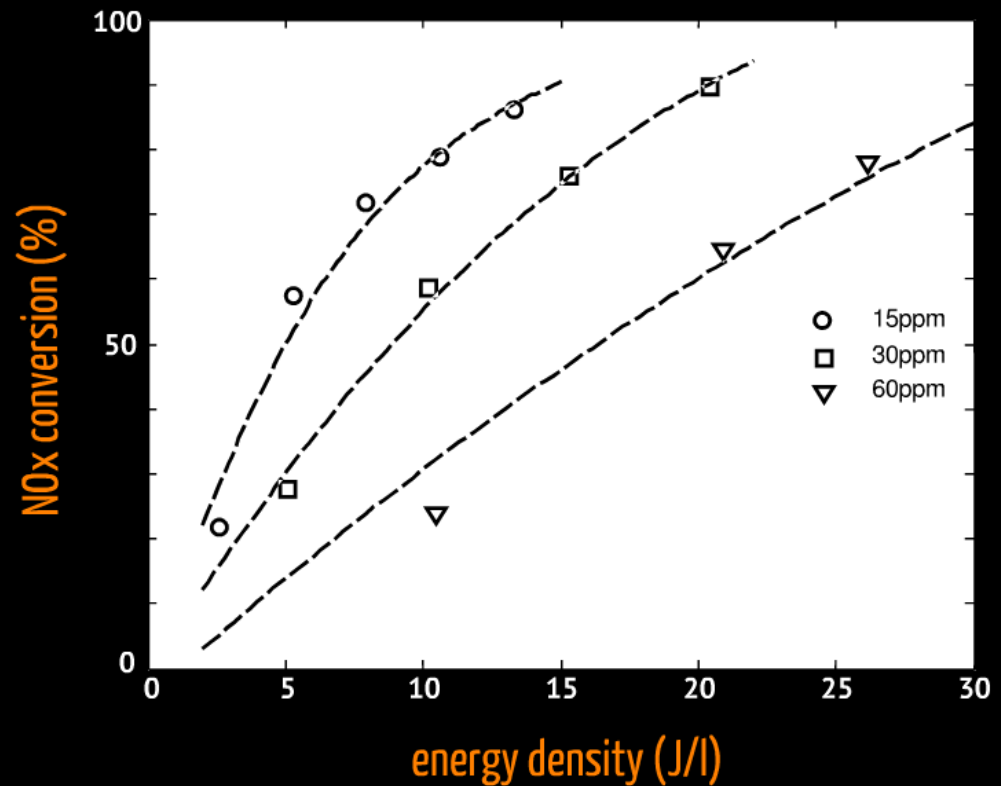


Uploading in Lab

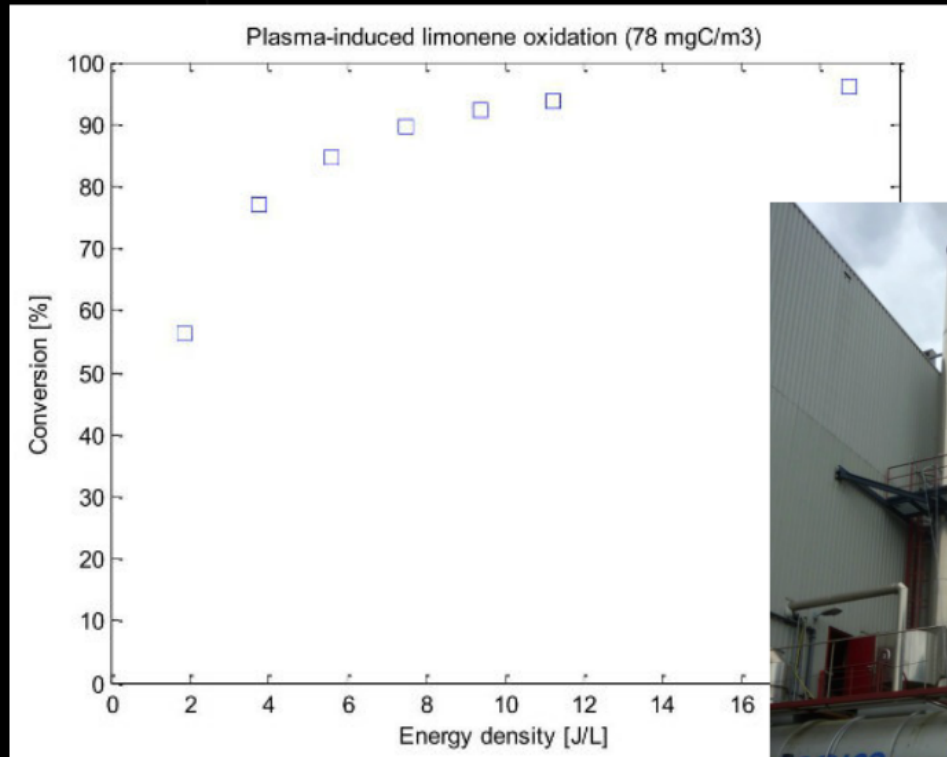


Loading Bay

80% NO_x removal (incinerator)



90% Limonene (VOC) removal (waste drying)



H₂S and NH₃ removal (odour abatement)

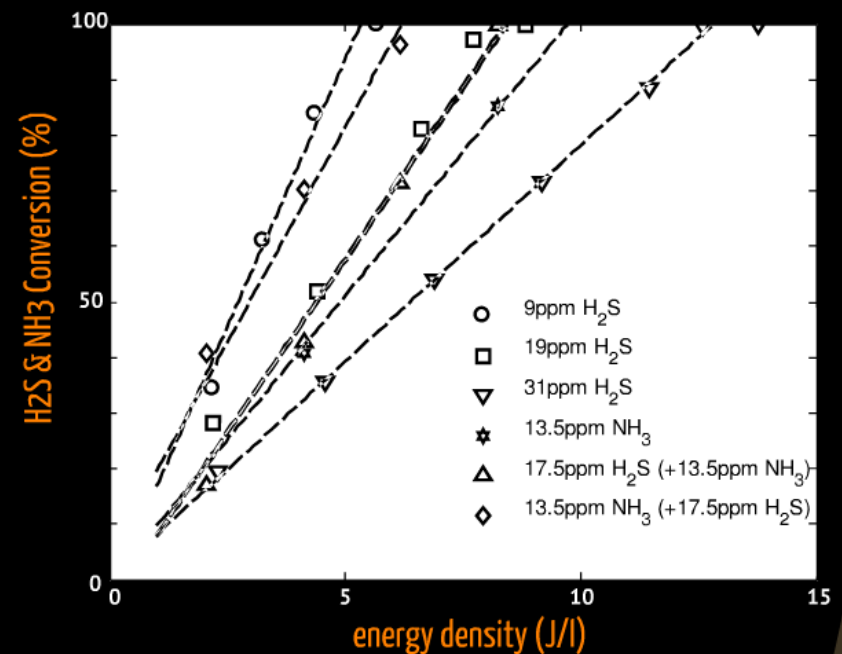


But also @

Food processing plants

&

Waste water treatment



overall performance

Free duct
150,000-350,000 odour units/m³
Odour
85-90%

NO_x
up to
60ppm
up to 90%

VOC's

(toluene, TCA, pentane, ethylene,
furane, terpens, aromatic CH, ketone,
aldehyde, organic sulfur) up to 500 ppm
80-99%

VOC's

(toluene, TCA, pentane, ethylene,
furane, terpens, aromatic CH, ketone,
aldehyde, organic sulfur)

up to 500 ppm

NOx

up to
60ppm

up to 90%

Odour

150.000-350.000 odour units/m³

85-90%

Fine dust
PM10 < 50 µg/m³
PM2.5 < 35 µg/m³

80-99%

Fine dust
PM 1.0-2.5 up to 3 ug/m³
PM 0.25-1.0 up to 250 ug/

0 odour

150.000-350.000 odour units/m³
(NER L27 - NL specifications)

85-90%

NO_x

up to

60ppm

up to 90%

Fine dust

PM 1.0-2.5 up to 3 ug

PM 0.25-1.0 up to 25

Odour

150.000-350.000 odour units/m³
(NER L27 - NL specifications)

85-90%

Fine dust

PM 1.0-2.5 up to 3 ug/m³ 80-95%

PM 0.25-1.0 up to 250 ug/m³ 50-65%

400 ppm
99% Tar
H₂S
20 ppm
99%

H₂S
20ppm

99%

400 ppm
99% Tar

H₂S
20ppm

99%



Les
grands épisodes de l'histoire

pour la traitement de la pollution de l'air
a commencé

On behalf of the



University of Technology
Eindhoven

Merci beaucoup

Feel free to contact us

HMVT
Postbus 174
6710 BD Ede
The Netherlands

www.hmvt.nl
www.corona-airtreatment.com
Mr. R. Geertsma MSc
+31 – (0)318 624 624

A satellite view of Earth from space, showing the Western Hemisphere. The Americas are visible on the left, and the African continent is on the right. The oceans are a deep blue, and the landmasses are brown and green. White clouds are scattered across the globe.

Feel free to contact us

HMVT

Postbus 174

6710 BD Ede

The Netherlands

www.hmvt.nl

www.corona-airtreatment.com

Mr. R. Geertsma MSc

#31 – (0)318 624 624