Solar Energy in Architectural Education

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UNIVERSIDADE NOVA DE LISBOA

LNEG

ISCTE IUL

SHC
INTERNATIONAL ENERGY AGENCY
Solar Heating & Cooling Programme

Solar Energy

why?

Architecture

people

NYCPEOPLEWATCHER

marialice.wordpress.com

emilezier.blogspot.com

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comfort

the-universality-of-cheese.blogspot.com

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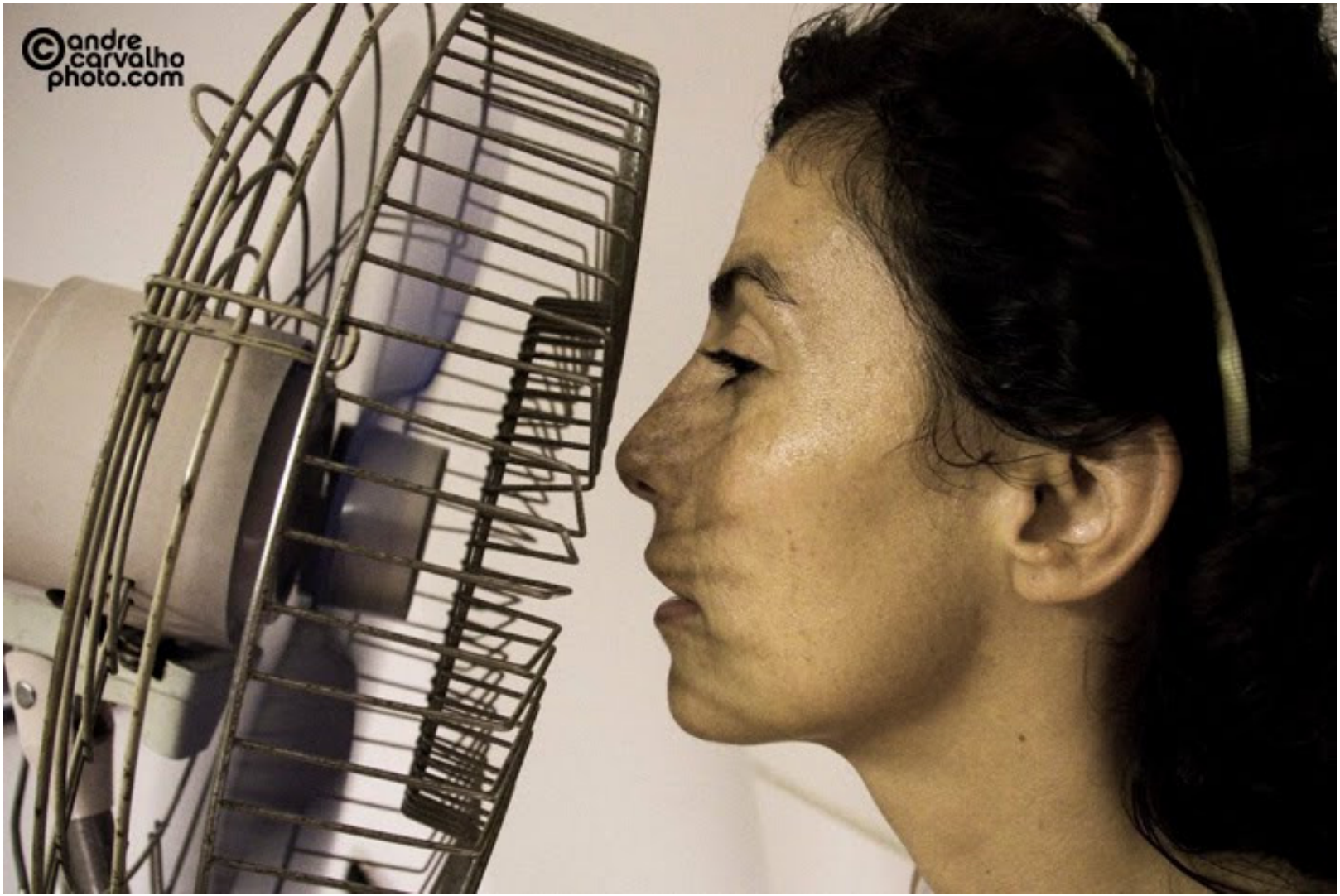


International conference
30/March/2012

Solar Energy and Architecture
Innovation and Development

Solar Energy in Architectural Education
Vasco Moreira Rato | ISCTE-IUL

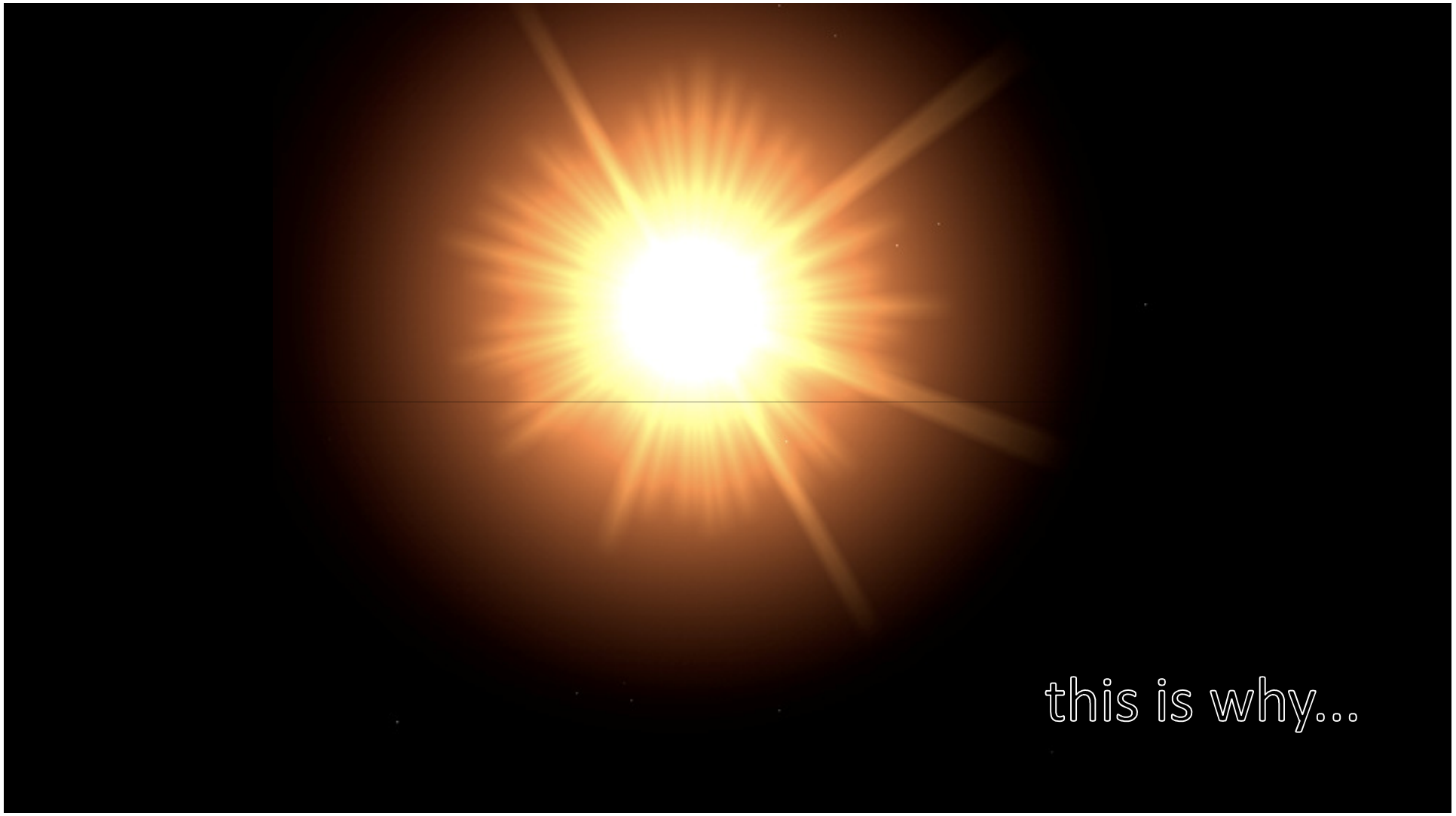
http://slowmuse.wordpress.com

heat cold **radiation** **wind** **humidity**

climate

$$\kappa\lambda\iota\mu\alpha$$

(*klima* = inclination)



http://www.swpc.noaa.gov

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how?

Architecture

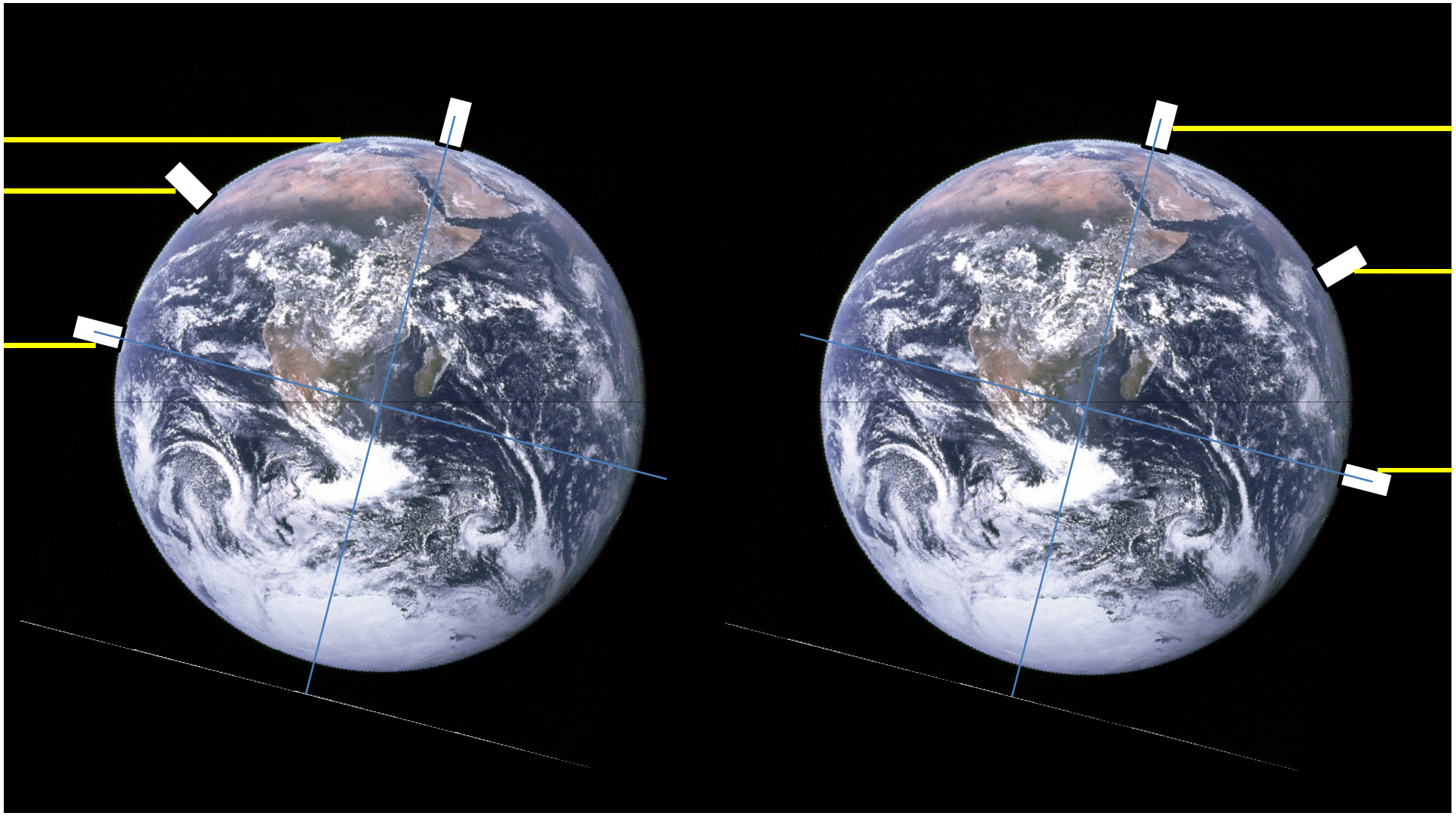
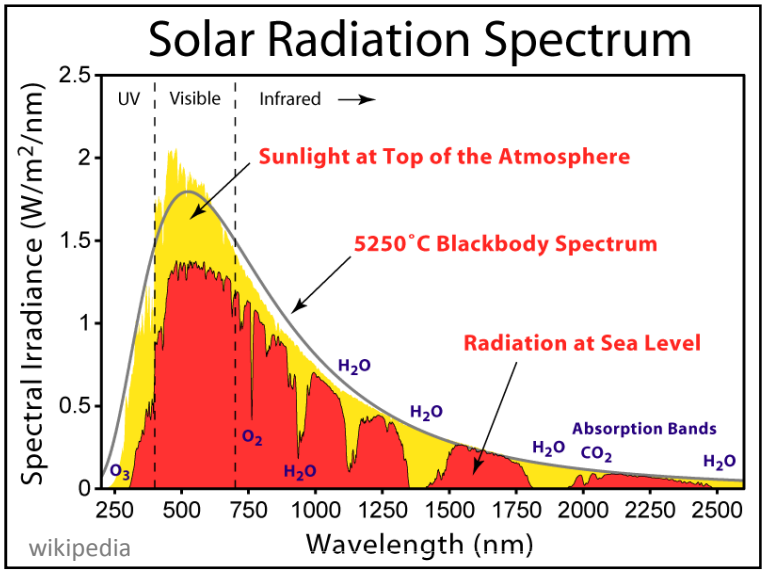
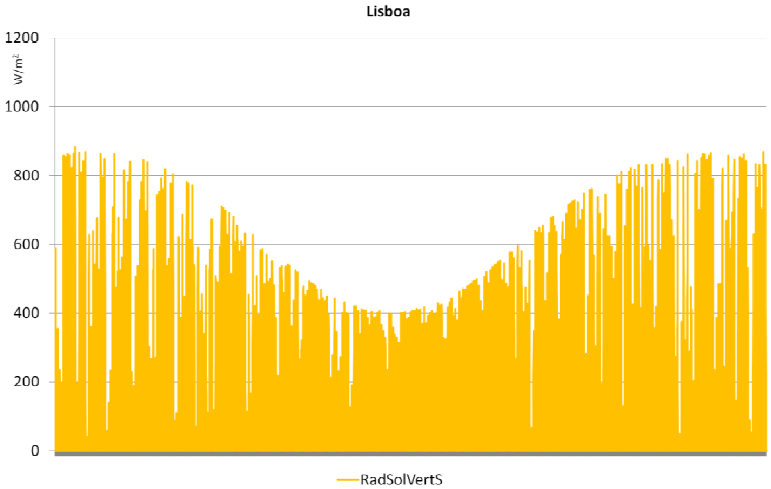
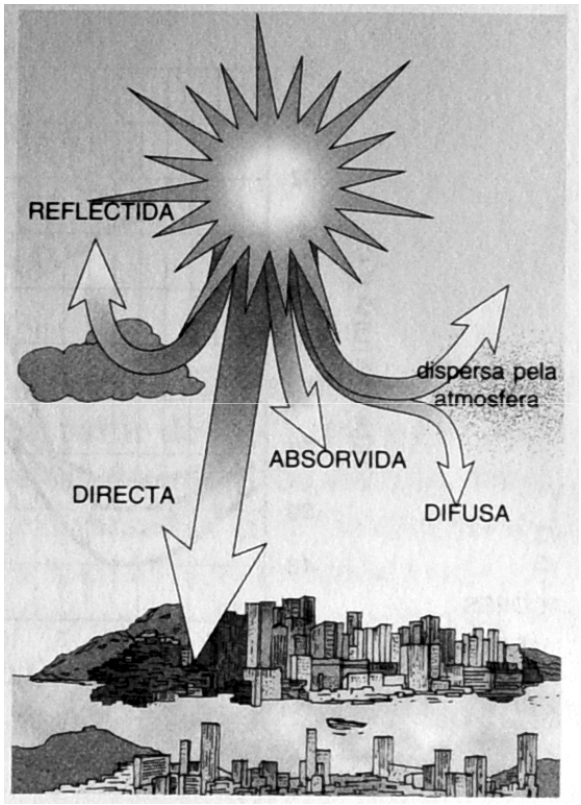


photo: http://upload.wikimedia.org/wikipedia/commons/9/97/The_Earth_seen_from_Apollo_17.jpg





Vasco Rato (c/ base dados climáticos SolTerm LNEG)



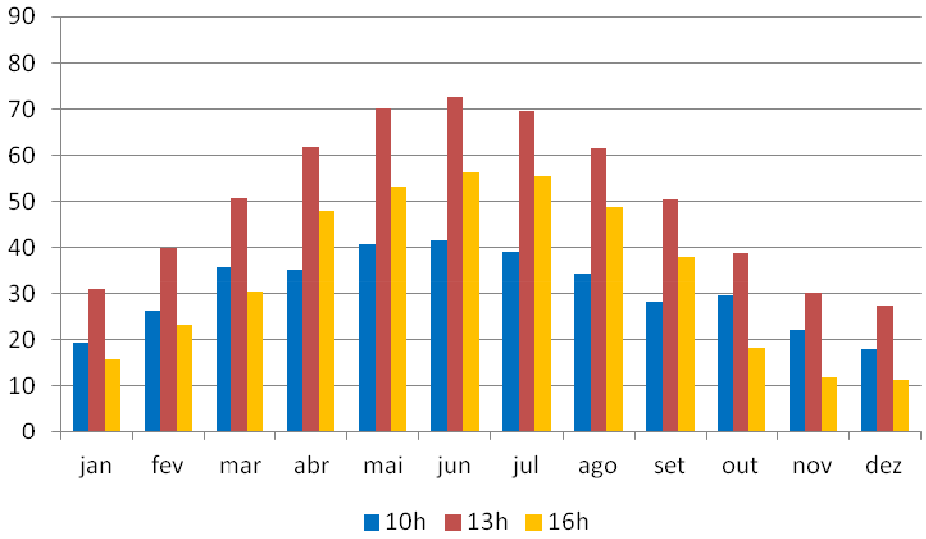
CANHA da PIEDADE *et al*, 2000

$$\delta = 23{,}45 \cdot sen\left(360 \cdot \frac{284 + N}{365}\right)$$

$$H = 15 \cdot [12 - (t \pm 0{,}0667 \cdot long)]$$

$$h = arcsen(sen\ L \cdot sen\ \delta + \cos L \cdot \cos \delta \cdot \cos H)$$

$$A = \arccos\left(\frac{sen\ L \cdot sen\ h - sen\ \delta}{\cos L \cdot \cos h}\right)$$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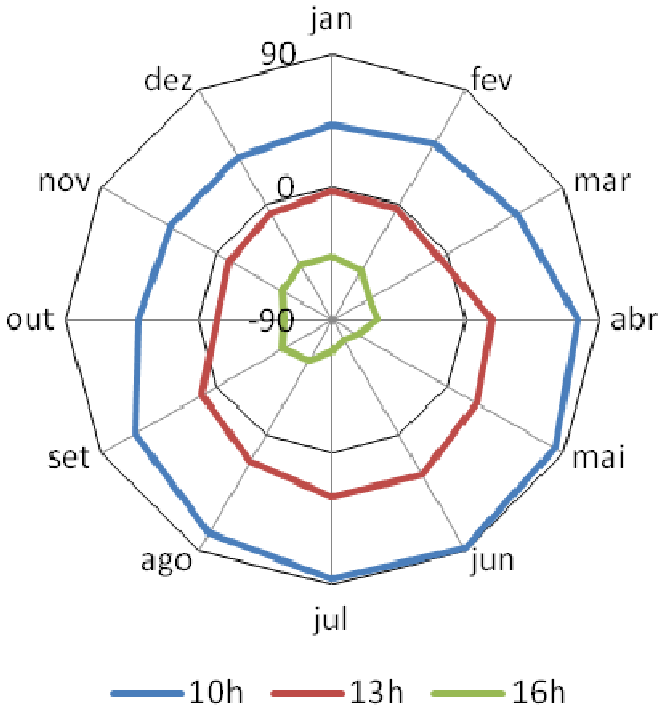
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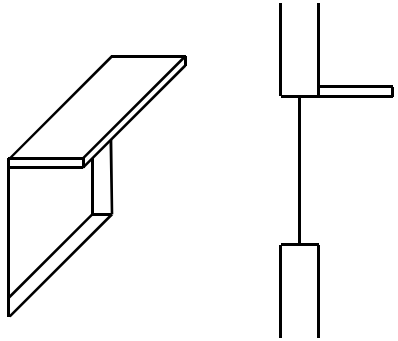

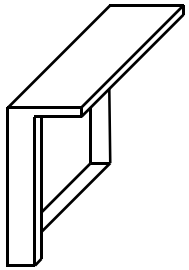

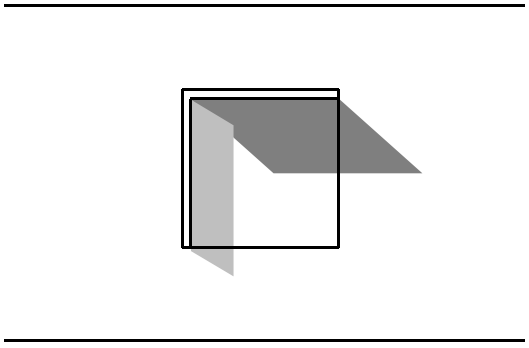

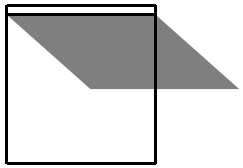

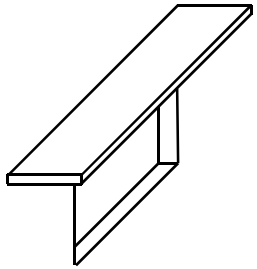

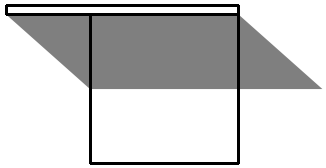

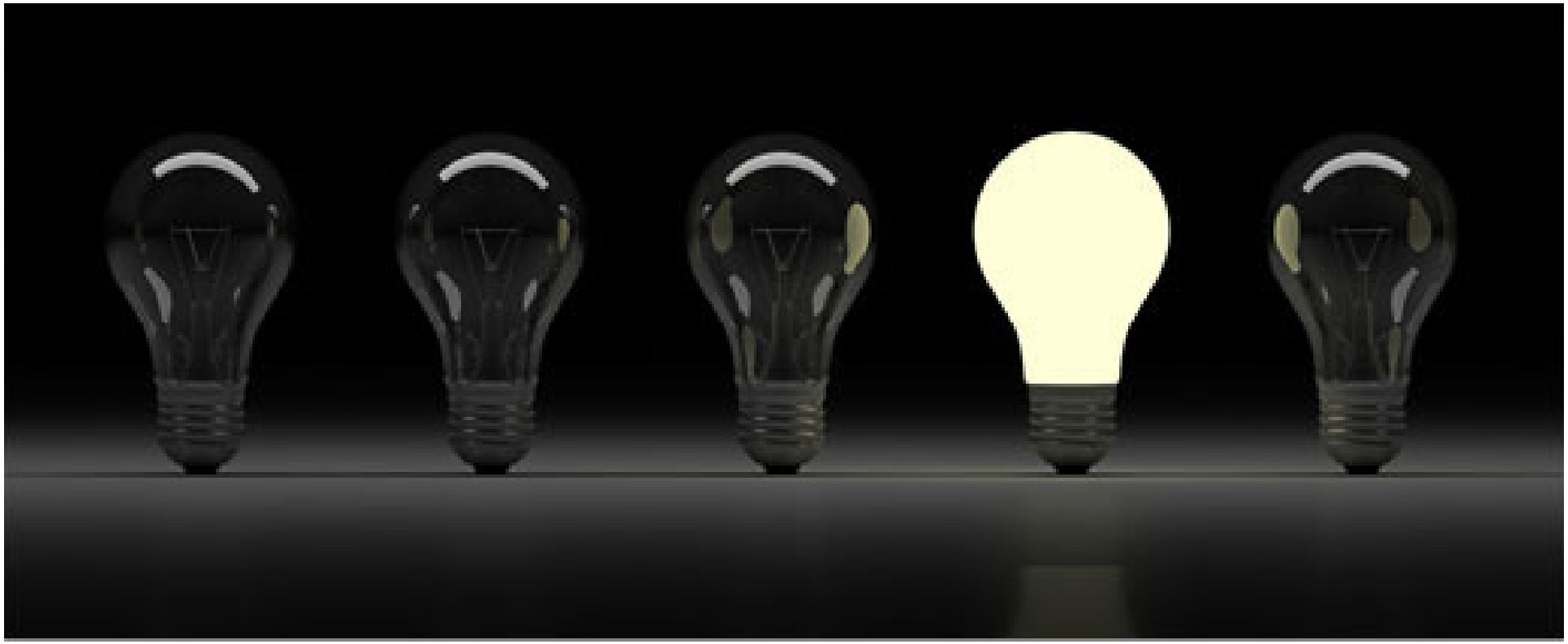

www.failure101.org

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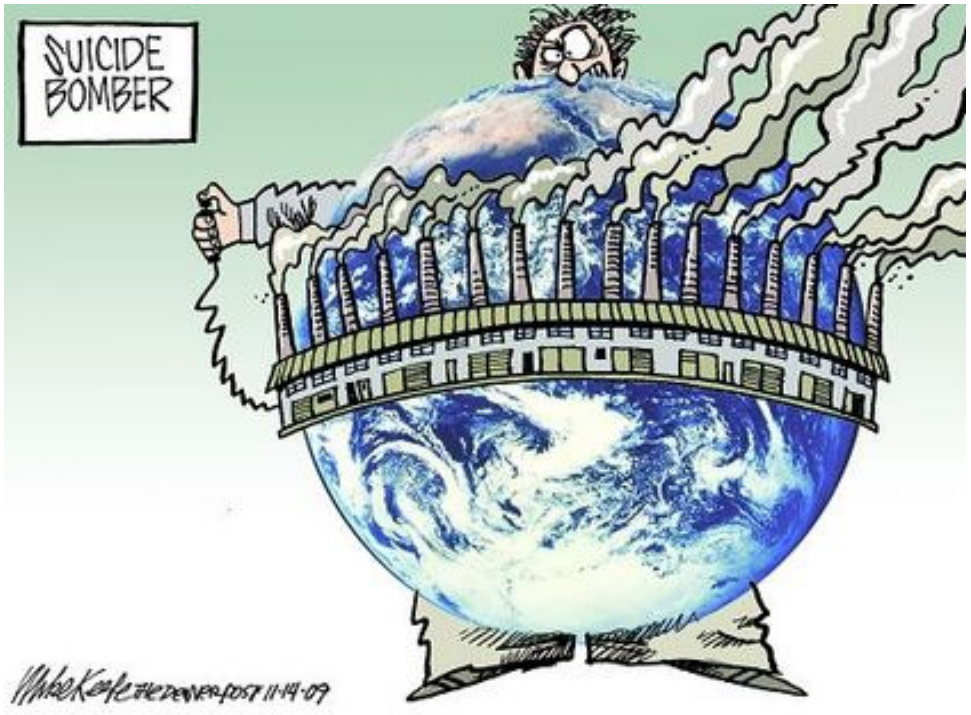
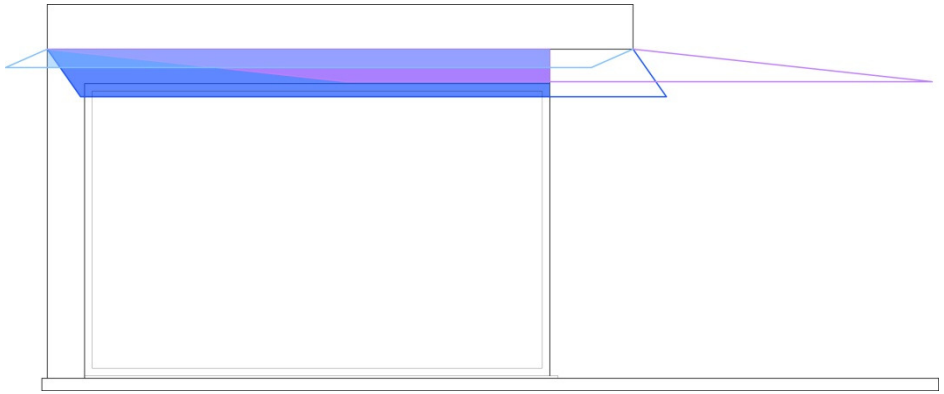
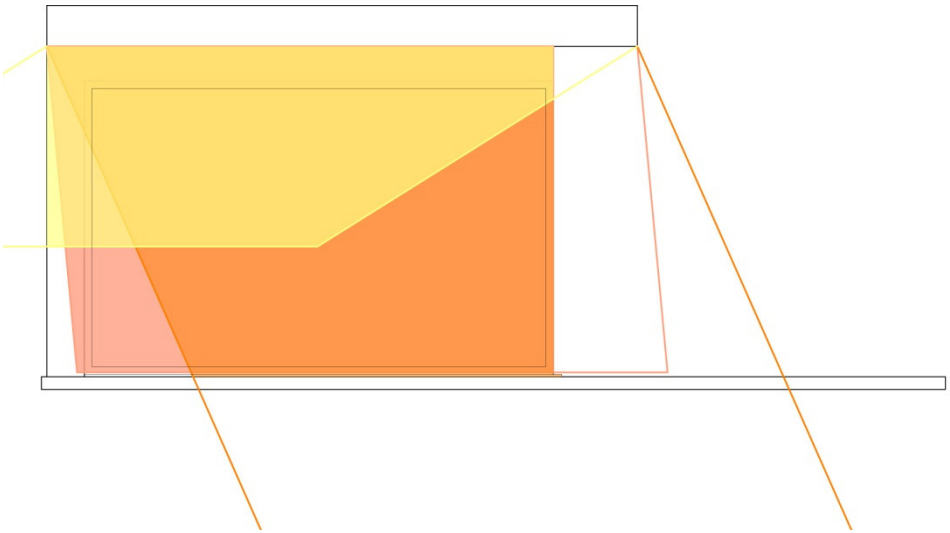
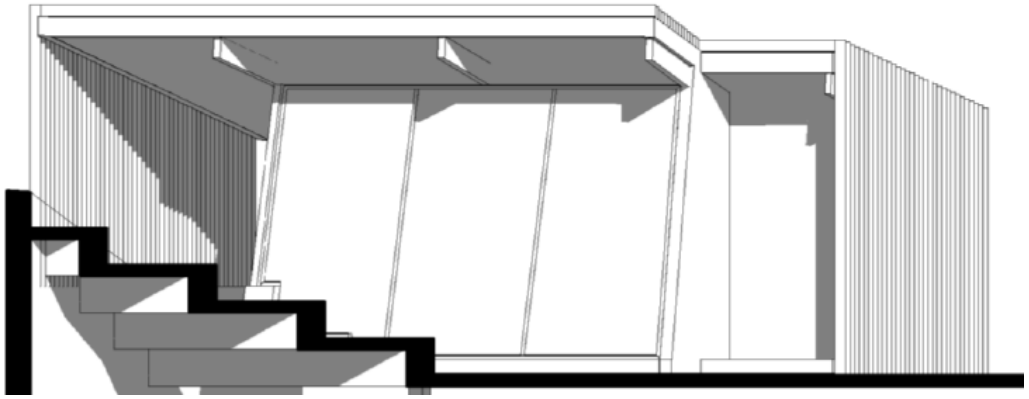
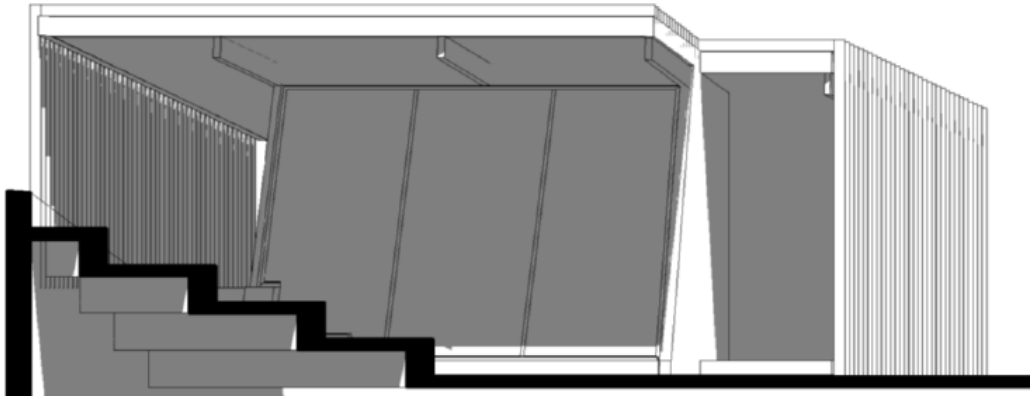


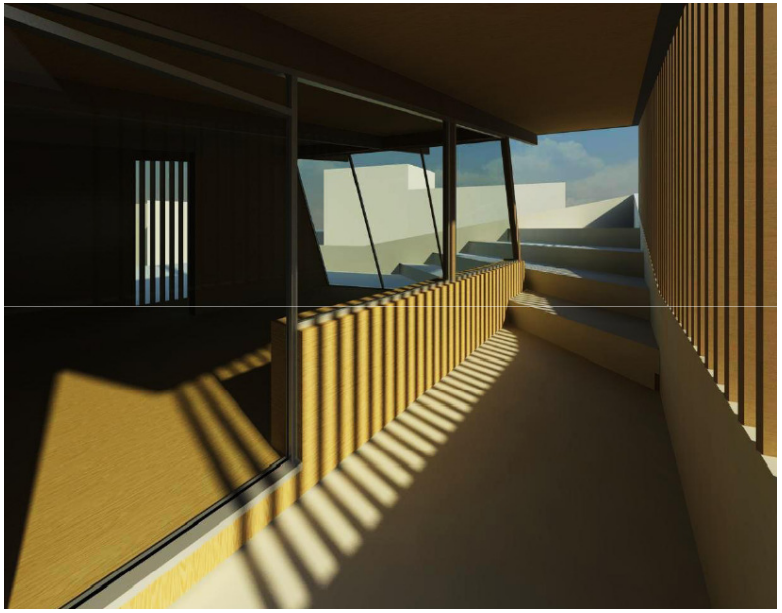
Pedro Cabrito, Edifício Solar XXI, LNEG











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teachers

future...

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talent + knowledge

thank you...