Na luta contra poluição luminosa!!!

DARK SKIES RANGERS

Eco-Escolas

NUCLIO
WWW.NUCLIO.PT
NÚCLEO INTERACTIVO DE ASTRONOMIA

dark sky®
alqueva
starlight tourism destination

CASCAIS

NOAO

GALILEO
Teacher Training Program

United Nations Educational, Scientific and Cultural Organization

IAU
International Astronomical Union

Partners for the International Year of Astronomy 2009

THE UNIVERSE
YOU'RE TO DISCOVER
BEYOND
ASTRONOMY

I believe I contribute to GTTP Movement → 2012

www.site.galileoteachers.org/announcements/209-global-gttp-ghou-community-map

Colaboração é sempre a resposta certa!!

LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

esa

ASTRONOMICAL SOCIETY OF THE PACIFIC

CASCAIS
CÂMARA MUNICIPAL

IASC
International Astronomical Search Collaboration

CosmoQuest

FAULKES TELESCOPE

EU-HOU

UniSchooLabS

Pampilhosa da Serra
câmara municipal

UNIVERSE QUEST

COSPAR
COMMITTEE ON SPACE RESEARCH

LCOGT.net

UNIVERSE AWARENESS

GALILEO MOBILE

ASTRONOMERS WITHOUT BORDERS

Europlanet
European Planetology Network

G-HOU

OPTICAL ASTRONOMY OBSERVATORY
NOAO
ARIZONA • LA SERENA, CHILE

DARK SKIES RANGERS

Open Discovery Space

discover the cosmos

The World At Night
TWAN

Observatório Astronómico
UNIVERSIDADE DE COIMBRA

BRITISH COUNCIL

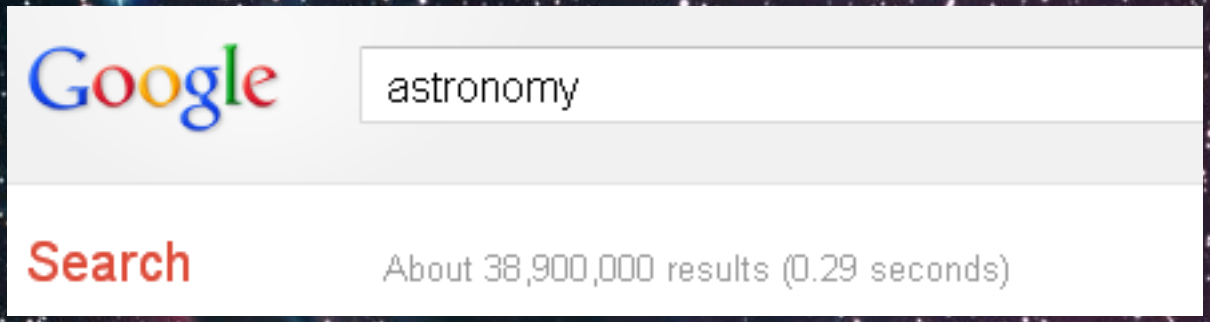
UNESCO
United Nations Educational, Scientific and Cultural Organization

IAU
International Astronomical Union

THE UNIVERSE YOU'LL DISCOVER
BEYOND
ASTRONOMY

FUNDAÇÃO CALOUSTE GULBENKIAN

Literacia Científica!!



NUCLIO
WWW.NUCLIO.PT
NÚCLEO INTERACTIVO DE ASTRONOMIA

GALILEO
Teacher Training Program

UNESCO
United Nations Educational, Scientific and Cultural Organization

IAU
International Astronomical Union

Partners for the International Year of Astronomy 2009

THE UNIVERSE
YOU'RE TO DISCOVER
BEYOND
ASTRONOMY

discover the COSMOS

OPEN DISCOVERY SPACE

E escola do futuro !!!

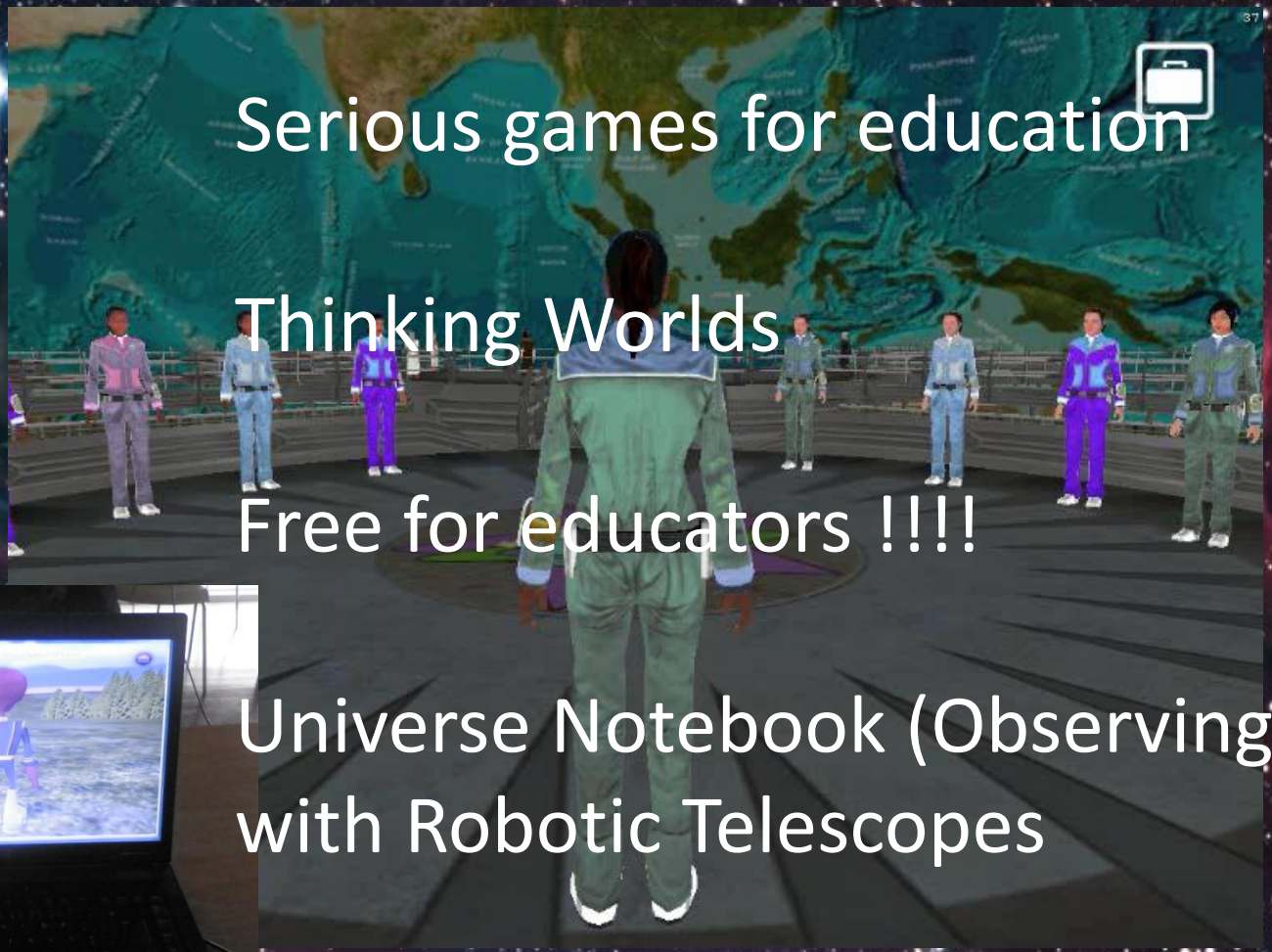
GO-LA

International Astronomical Search Collaboration

45 Countries
Over 500
Schools

Haus der Astronomie
Centre for Astronomy Education and Outreach

Universe Quest



Serious games for education

Thinking Worlds

Free for educators !!!!

Universe Notebook (Observing with Robotic Telescopes

CASCAIS
CÂMARA MUNICIPAL

Astronomical Society of the Pacific

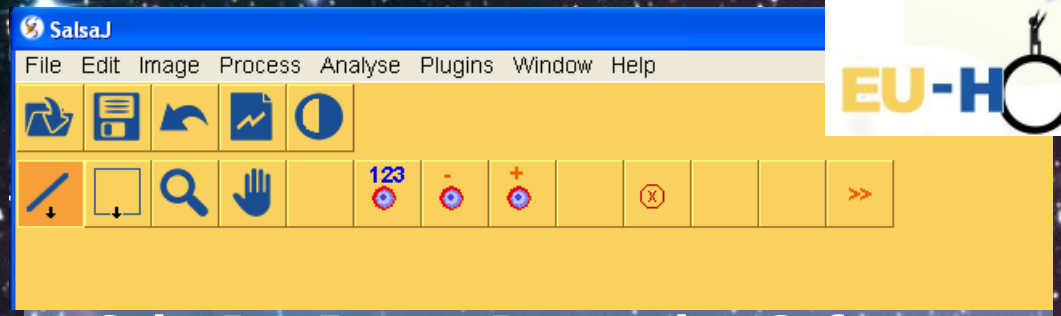
Girl Scouts

G-HOU

NSF

Formação para a utilização de recursos digitais para o ensino das ciências. Metodologias modernas

Investigação científica em sala de aula - > Inquiry

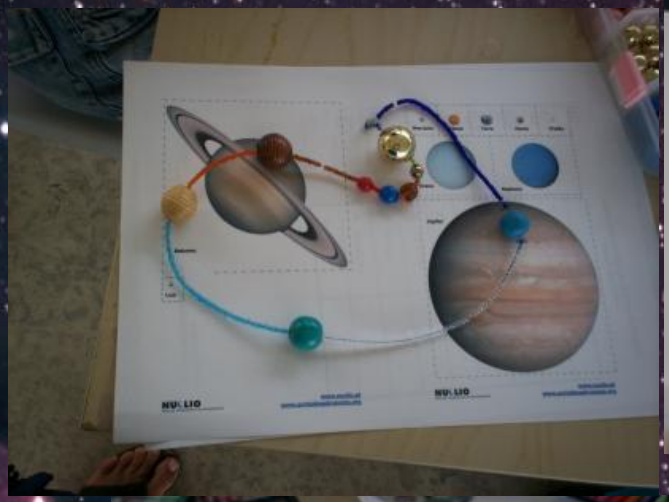


SalsaJ → Image Processing Software

NUCLIO
WWW.NUCLIO.PT
NÚCLEO INTERACTIVO DE ASTRONOMIA

GALILEO

Formação Certificada pelo CCPFC – Astronomia Hands-on – Vila Nova de Gaia, Chaves, Loulé, Vila Nova da Barquinha, Coimbra. Cascias, …….. nuclio.org/cursos



UNIVERSE AWARENESS

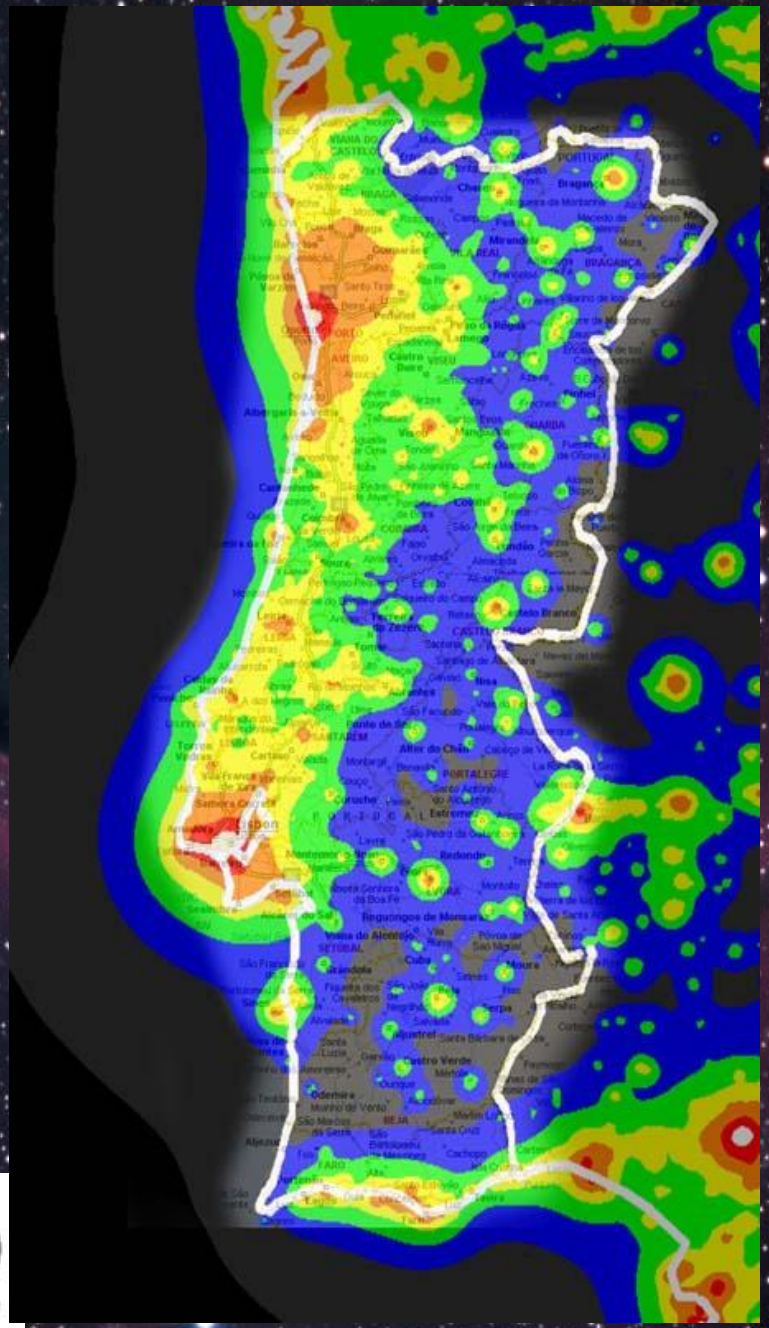
Galileo Teacher Training Program &

Dark Skies Awareness Campaign

DARK SKIES RANGERS

O QUE É POLUIÇÃO LUMINOSA ?

Gustavo Rojas - Universidade Federal de São Carlos



NUCLIO
WWW.NUCLIO.PT
NÚCLEO INTERACTIVO DE ASTRONOMIA

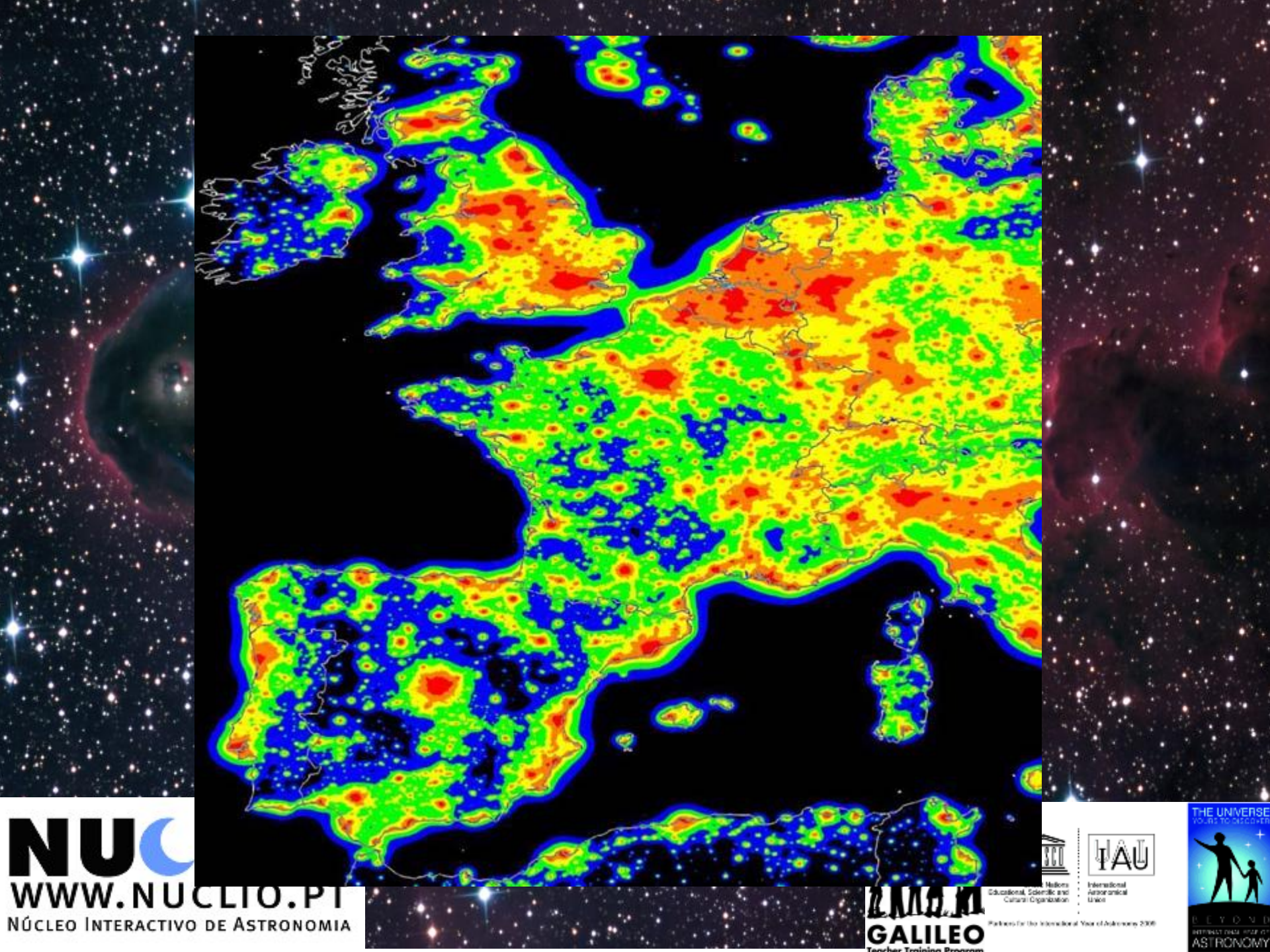
GALILEO
Teacher Training Program

United Nations Educational, Scientific and Cultural Organization

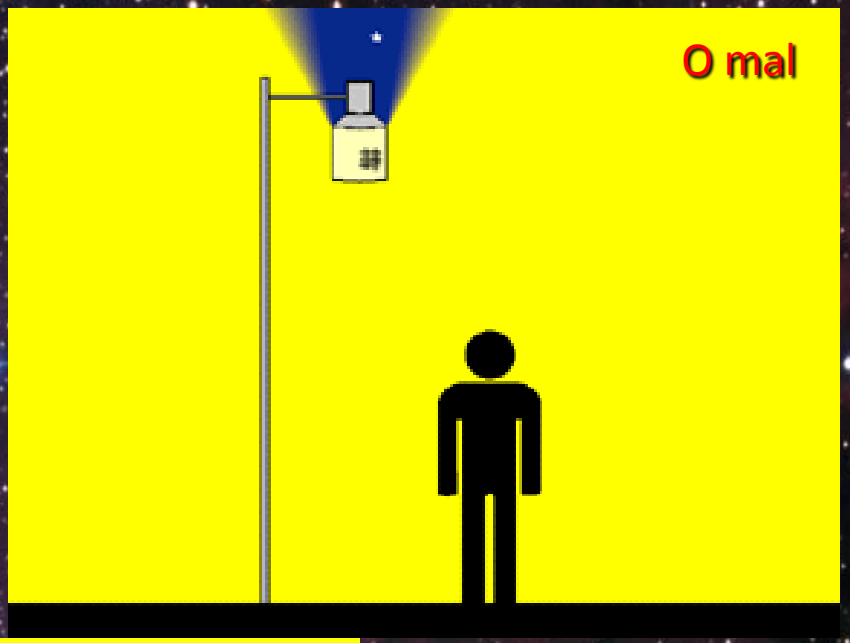
International Astronomical Union

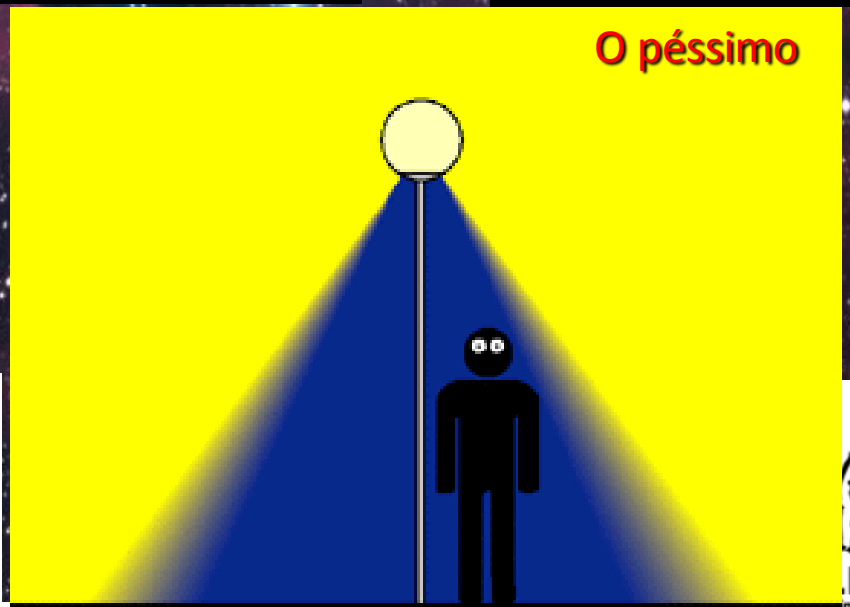
Partners for the International Year of Astronomy 2009

THE UNIVERSE YOU'RE TO DISCOVER
BEYOND
INTERNATIONAL YEAR OF ASTRONOMY


NUC
WWW.NUCLIO.PT
NÚCLEO INTERACTIVO DE ASTRONOMIA
GALILEO
Teacher Training Program
IAU
International Astronomical Union
THE UNIVERSE
BEYOND
ASTRONOMY

ILUMINAÇÃO PÚBLICA





NUCLIO
WWW.NUCLIO.PT
NÚCLEO INTERACTIVO DE ASTRONOMIA

Mais Luz NÃO é Mais Segurança!

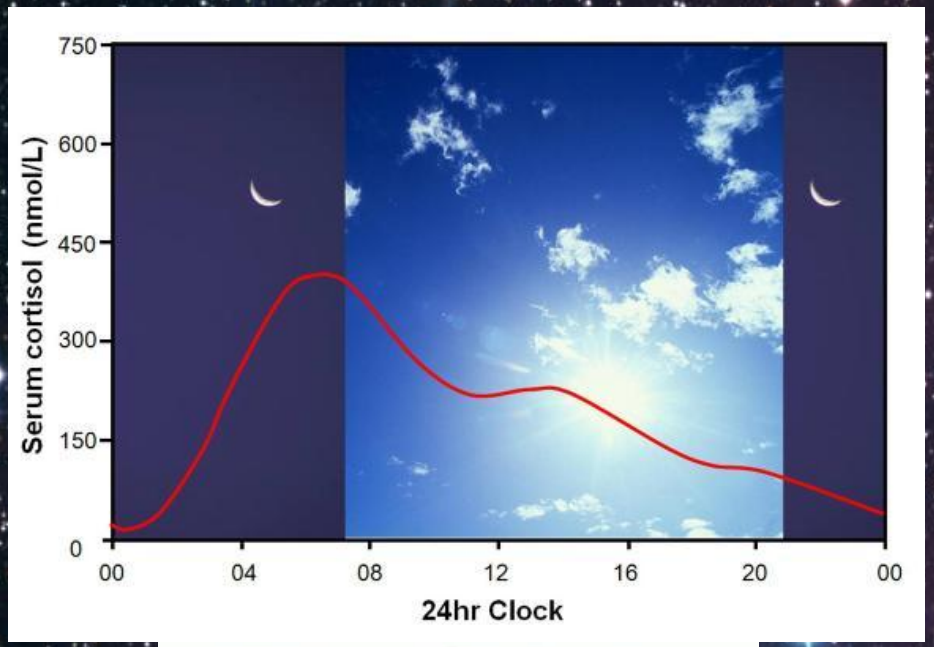
The glare from an unshielded light creates deep shadows.

The glare from the light hid a possible attacker.

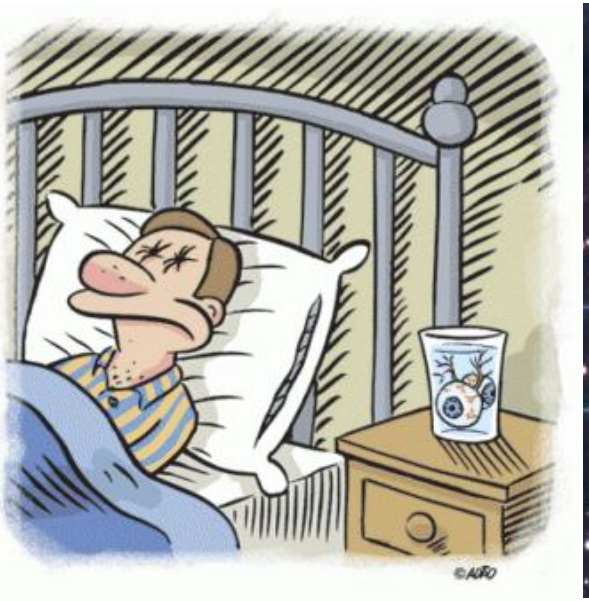
Iluminação inadequada reduz a visibilidade, diminuindo a sensibilidade ao contraste e percepção de cores

Idosos podem levar 3 vezes mais tempo que os jovens para se adaptar a mudanças de iluminação.

ADVERTÊNCIA: EXCESSO DE LUZ FAZ MAL À SAÚDE



O excesso de iluminação pode desregular nosso relógio biológico, alterando o ciclo circadiano e a produção de melatonina.



Distúrbios no Sono podem levar a obesidade, stress, depressão e diabetes

NU
WWW.
NÚCLEO INTER

GALILEO
Teacher Training Program

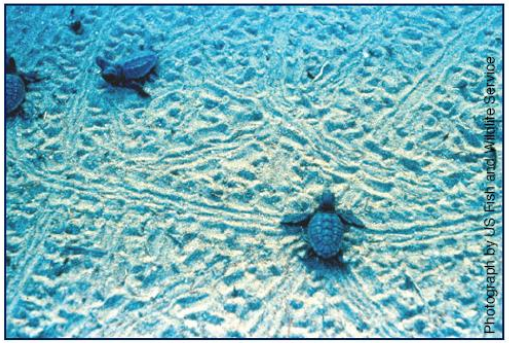
United Nations Educational, Scientific and Cultural Organization

International Astronomical Union

THE UNIVERSE
BEYOND
ASTRONOMY

Insects are attracted to the white light of floodlights.

uld.



Turtles that are confused by light pollution (shown above with their erratic trails), are unable to find their way to the ocean.

Pine Barrens tree frog

Impactos na flora e a fauna

No que é que isso contribui para a minha felicidade?

NUCLIO
WWW.NUCLIO.PT
NÚCLEO INTERACTIVO DE ASTRONOMIA

GALILEO
Teacher Training Program

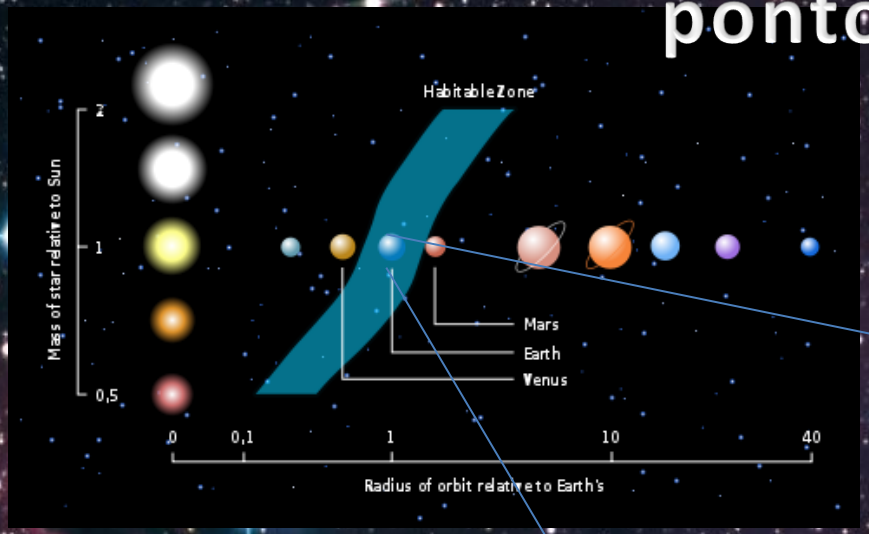
United Nations Educational, Scientific and Cultural Organization

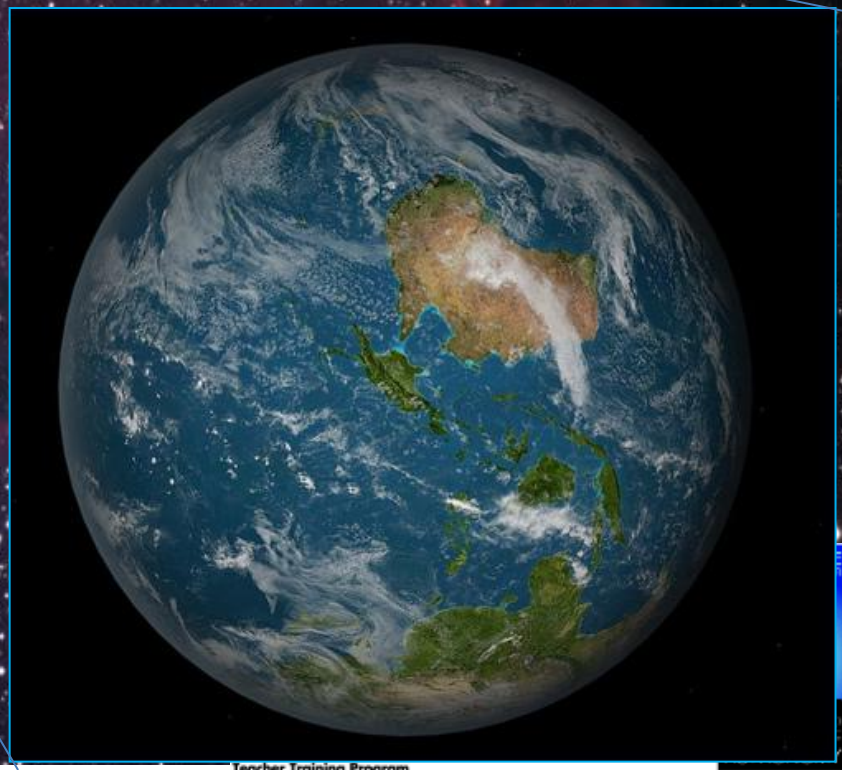
International Astronomical Union

Partners for the International Year of Astronomy 2009

THE UNIVERSE
YOU'RE TO DISCOVER
BEYOND
ASTRONOMY

Habitantes de uma fração minúscula de um ponto !!!





NUCLIO
WWW.NUCLIO.PT
NÚCLEO INTERACTIVO DE ASTRONOMIA

Na luta contra poluição luminosa!!!

DARK SKIES RANGERS

Eco-Escolas

NUCLIO
WWW.NUCLIO.PT
NÚCLEO INTERACTIVO DE ASTRONOMIA

dark sky®
alqueva
starlight tourism destination

CASCAIS

NOAO

GALILEO
Teacher Training Program

United Nations Educational, Scientific and Cultural Organization

IAU
International Astronomical Union

Partners for the International Year of Astronomy 2009

THE UNIVERSE
YOU'RE TO DISCOVER
BEYOND
ASTRONOMY

Escola Secundária Maria Lamas 2011

The First Dark Skies Rangers in Portugal

NUCLIO
WWW.NUCLIO.PT
NÚCLEO INTERACTIVO DE ASTRONOMIA

Escola Maria Lamas - Torres Novas

NÚCLEO INTERACTIVO DE ASTRONOMIA

GALILEO Teacher Training Program

United Nations Educational, Scientific and Cultural Organization

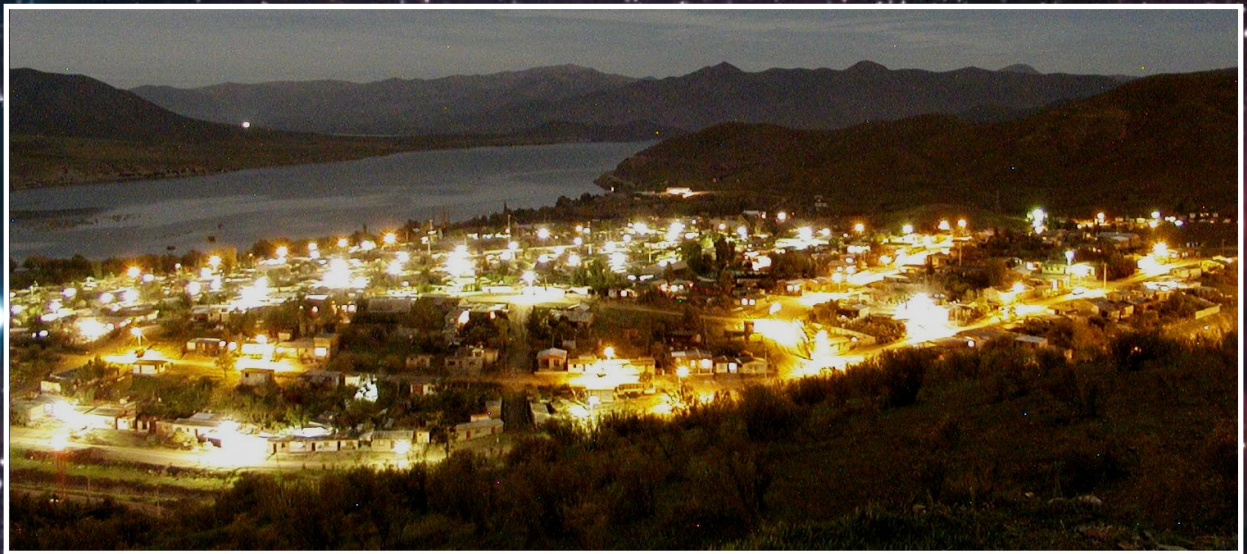
International Astronomical Union

Partners for the International Year of Astronomy 2009

THE UNIVERSE YOU'RE TO DISCOVER

BEYOND ASTRONOMY

EXEMPLOS DE MÁ E BOA ILUMINAÇÃO



NUCL
WWW.NUCL
NÚCLEO INTERACTIVO DE
IAU
International Astronomical Union
GALILEO
THE UNIVERSE
BEYOND
ASTRONOMY

O espaço visto da Terra !!!!!

NUCLIO
WWW.NUCLIO.PT
NÚCLEO INTERACTIVO DE ASTRONOMIA

GALILEO
Teacher Training Program

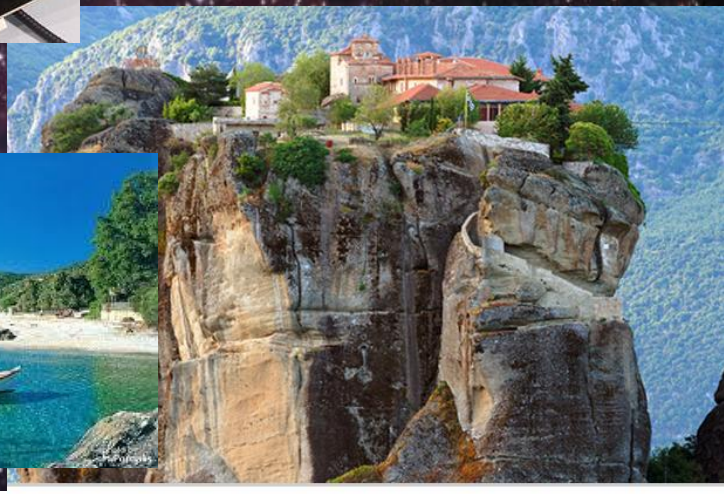
IAU
International Astronomical Union

United Nations Educational, Scientific and Cultural Organization

THE UNIVERSE
BEYOND
ASTRONOMY

Concurso
dsr.nuclio.pt/concurso/

Os alunos podem **adotar uma rua** (edifício, jardim, praça…), realizar auditorias da iluminação exterior, avaliar a eficiência das luminárias, medir o grau de luminosidade do céu noturno (poluição luminosa), e sensibilizar a comunidade educativa e as autoridades locais para alterarem os sistemas de iluminação e preservarem o céu noturno. Os professores podem **elaborar um plano de aula**.



NUCLIO
WWW.NUCLIO.PT
NÚCLEO INTERACTIVO DE ASTRONOMIA

CASCAIS
CÂMARA MUNICIPAL

~~COMPETIÇÃO~~

X

COLABORAÇÃO

NUCLIO
WWW.NUCLIO.PT
NÚCLEO INTERACTIVO DE ASTRONOMIA

GALILEO
Teacher Training Program

United Nations Educational, Scientific and Cultural Organization

IAU International Astronomical Union

Partners for the International Year of Astronomy 2009

THE UNIVERSE
BEYOND
ASTRONOMY

Obrigada !!!

rosa.doran@nuclio.pt

dsr.nuclio.pt

www.nuclio.pt

www.facebook.com/nuclio

NOAO

dark sky® alqueva
starlight tourism destination

Eco-Escolas

NUCLIO
HTTP://WWW.NUCLIO.PT

GALILEO Teacher Training Program

United Nations Educational, Scientific and Cultural Organization

International Astronomical Union

Partners for the International Year of Astronomy 2009

THE UNIVERSE YOU'RE TO DISCOVER

BEYOND ASTRONOMY