

Starlight

El cielo estrellado como patrimonio del territorio

Cipriano Marín

Coordinador de la Iniciativa Starlight
Urban Futures Programme (UNESCO-MaB)
Fundación Starlight



STARLIGHT
A COMMON HERITAGE



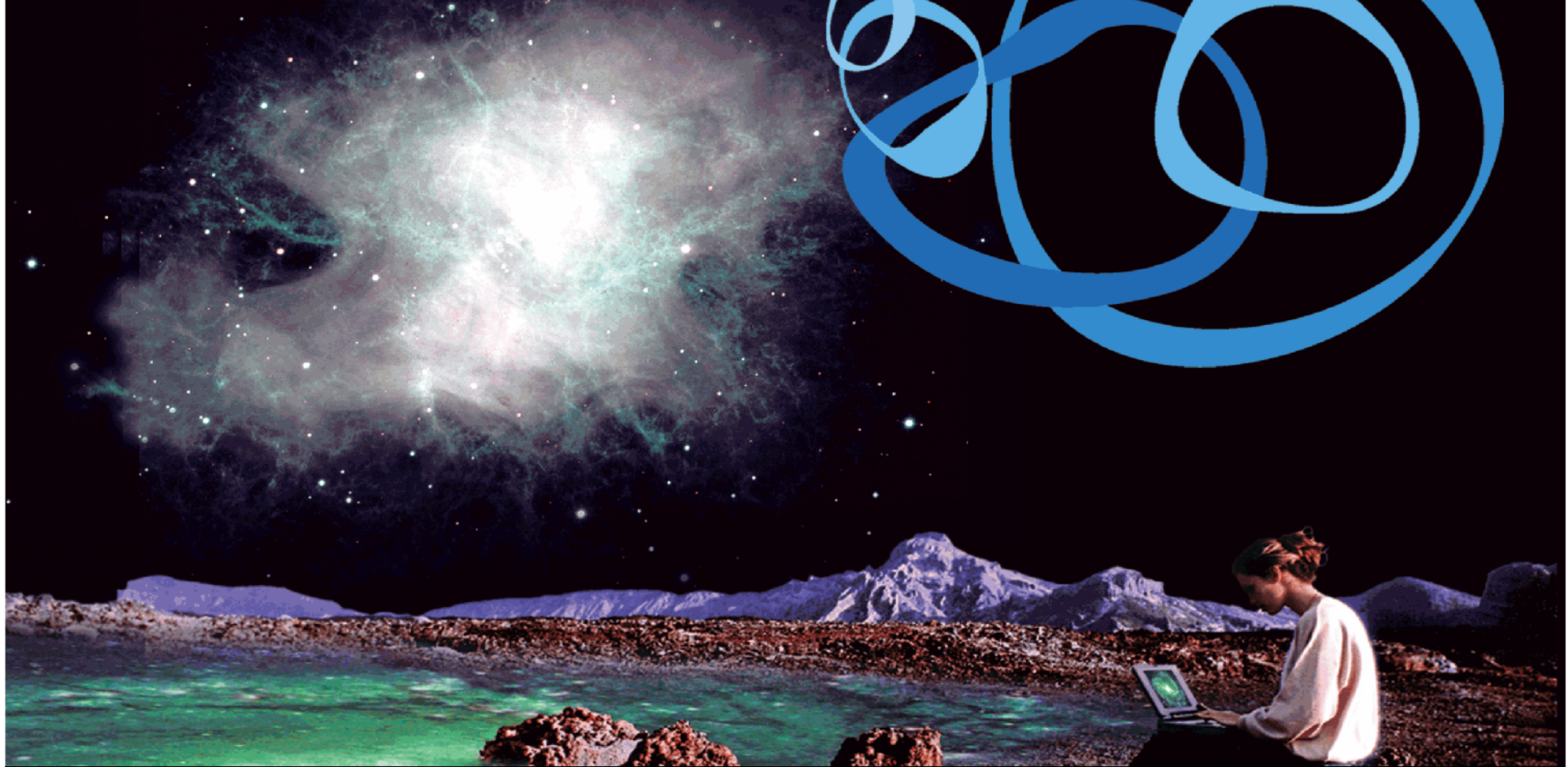
LA RESERVA DE LA BIOSFERA DE LA RIOJA
DESTINO TURISTICO STARLIGH
10-13 de Julio | Logroño – La Rioja



UNWTO Knowledge Network



DECLARACIÓN STARLIGHT
en Defensa del Cielo Nocturno
y el Derecho a la Luz de las Estrellas (2007)



UNESCO, UNWTO, IAU, UNEP-CMS, SCBD, MaB Programma, Ramsar Convention - IAC

DECLARACIÓN
SOBRE LA DEFENSA DE
NOCTURNO Y EL D
A LA LUZ DE LAS ESTR



DECLARACIÓN DE LA PALMA
La Palma, 19-20 de Abril de 20

DÉCLARATION
SUR LA DEFENCE DU CIEL
NOCTURNE ET LE DROIT À LA
LUMIÈRE DES ÉTOILES



DÉCLARATION DE LA PALMA
Îles Canaries, Avril 20, 2007

ARATION
OF THE NIGHT
THE RIGHT TO
RIGHT



A DECLARATION
Is, April 19, 20, 2007



“El derecho a un cielo nocturno no contaminado que permita disfrutar de la contemplación del firmamento debe considerarse como un derecho inalienable de la Humanidad, equiparable al resto de los derechos ambientales, sociales y culturales.

Declaración Starlight.. Artículo 1.



UAI RESOLUCIÓN B5 - 2009
en Defensa del Cielo Nocturno y el Derecho ala Luz de las Estrellas
in Defence of the Night Sky and the Right to Starlight

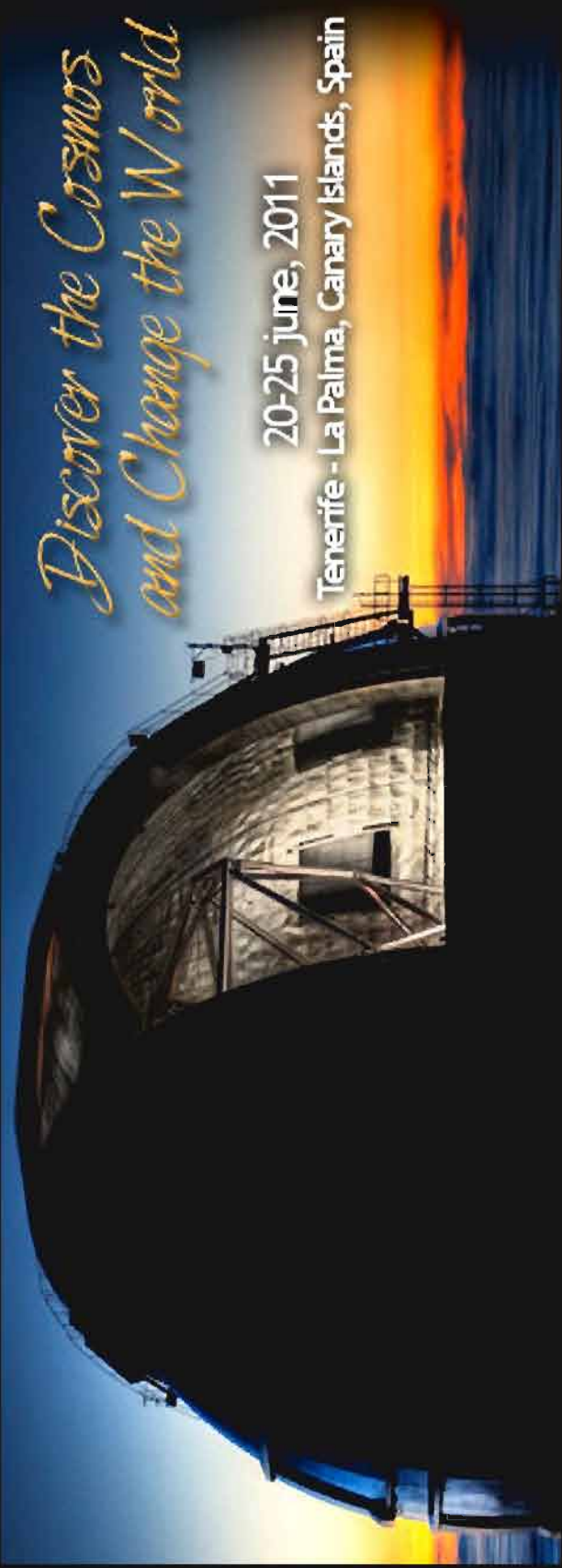
XXVII Asamblea General de la Unión Astronómica Internacional – Rio de Janeiro

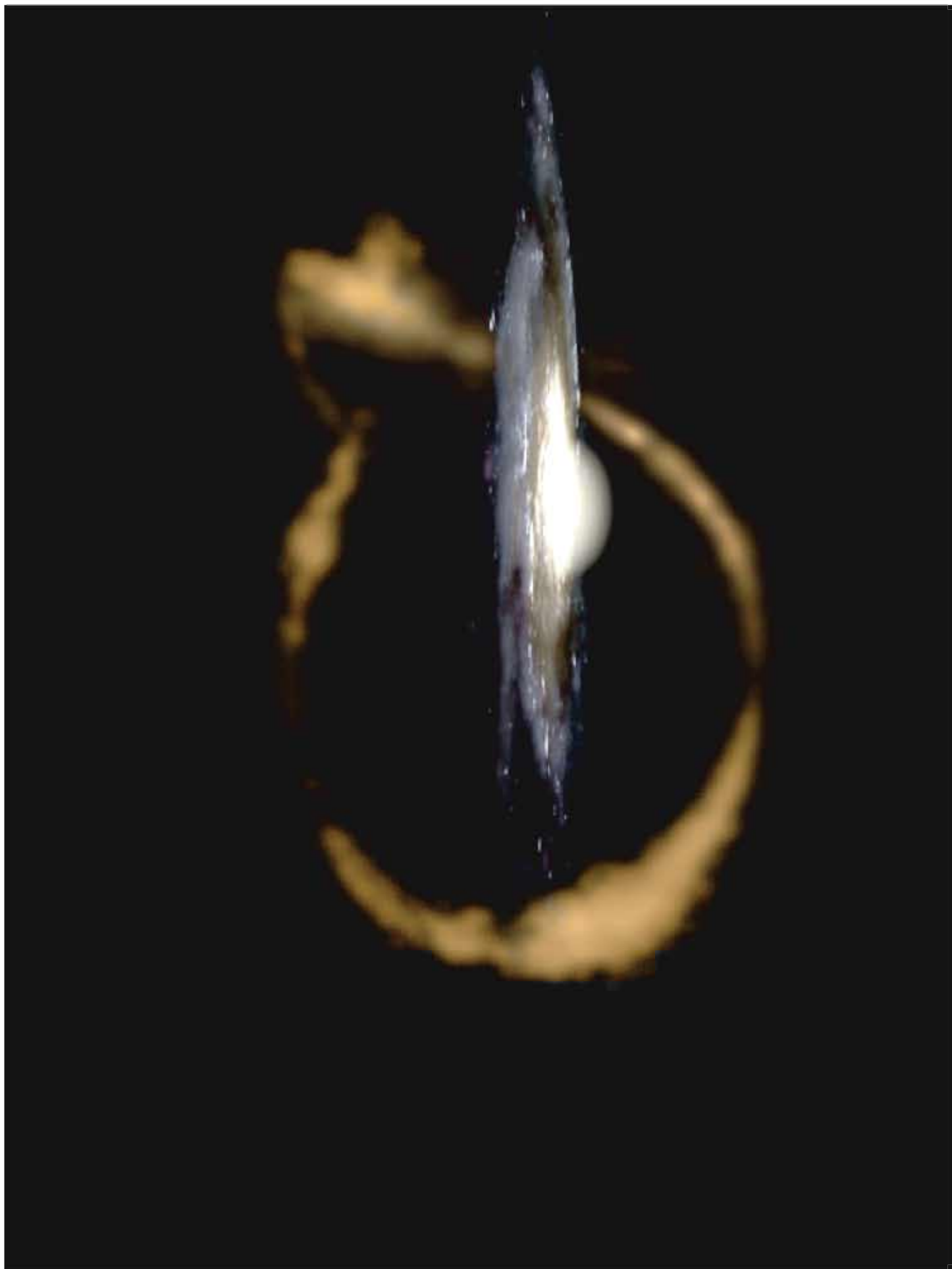
IAU members be encouraged to take all necessary measures to involve the parties related to skyscape protection in raising public awareness – be it at local, regional, national, or international level – about the contents and objectives of the International Conference in Defence of the Quality of the Night Sky and the Right to Observe Stars [<http://www.starlight2007.net/>], in particular the educational, scientific, cultural, health and recreational importance of preserving access to an unpolluted night sky for all humankind.



Discover the Cosmos and Change the World

20-25 June, 2011
Tenerife - La Palma, Canary Islands, Spain

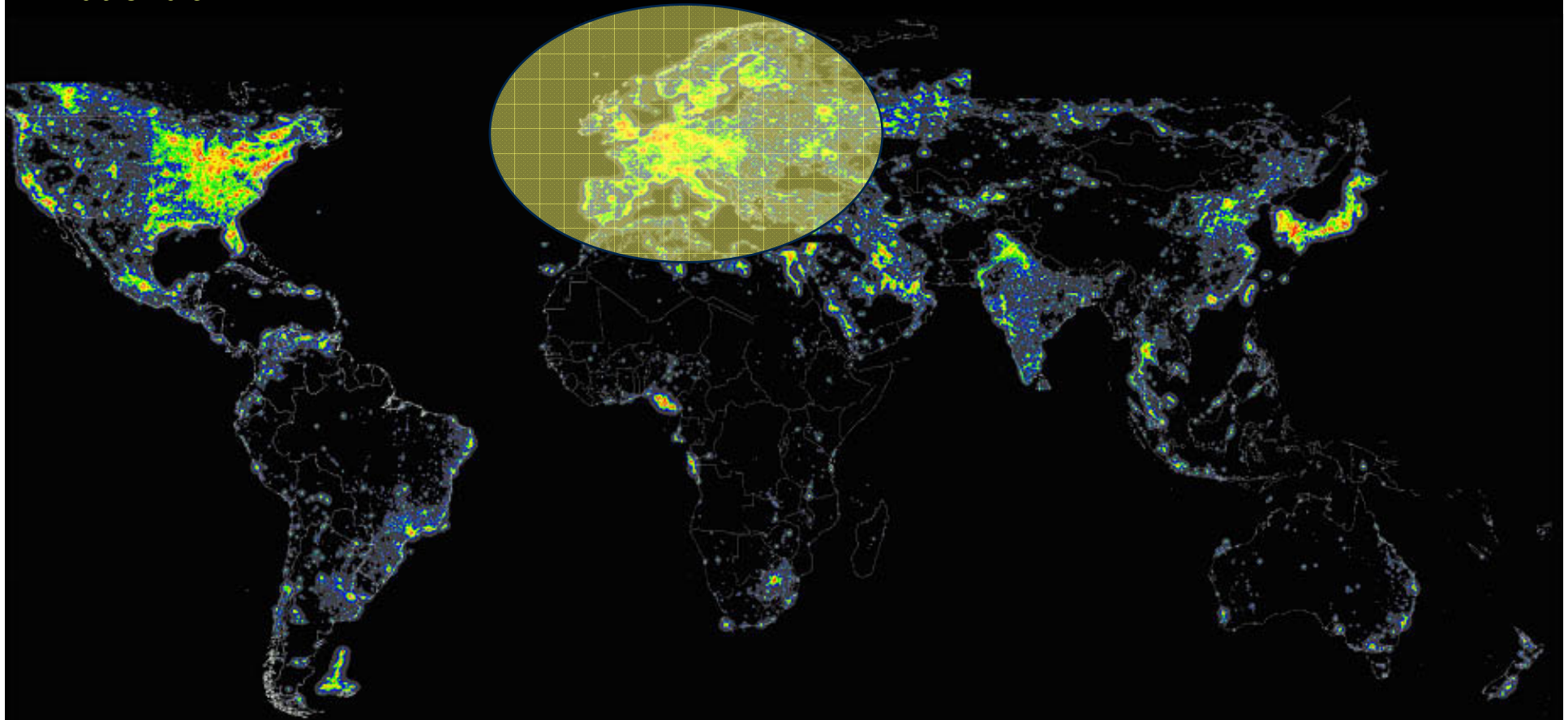




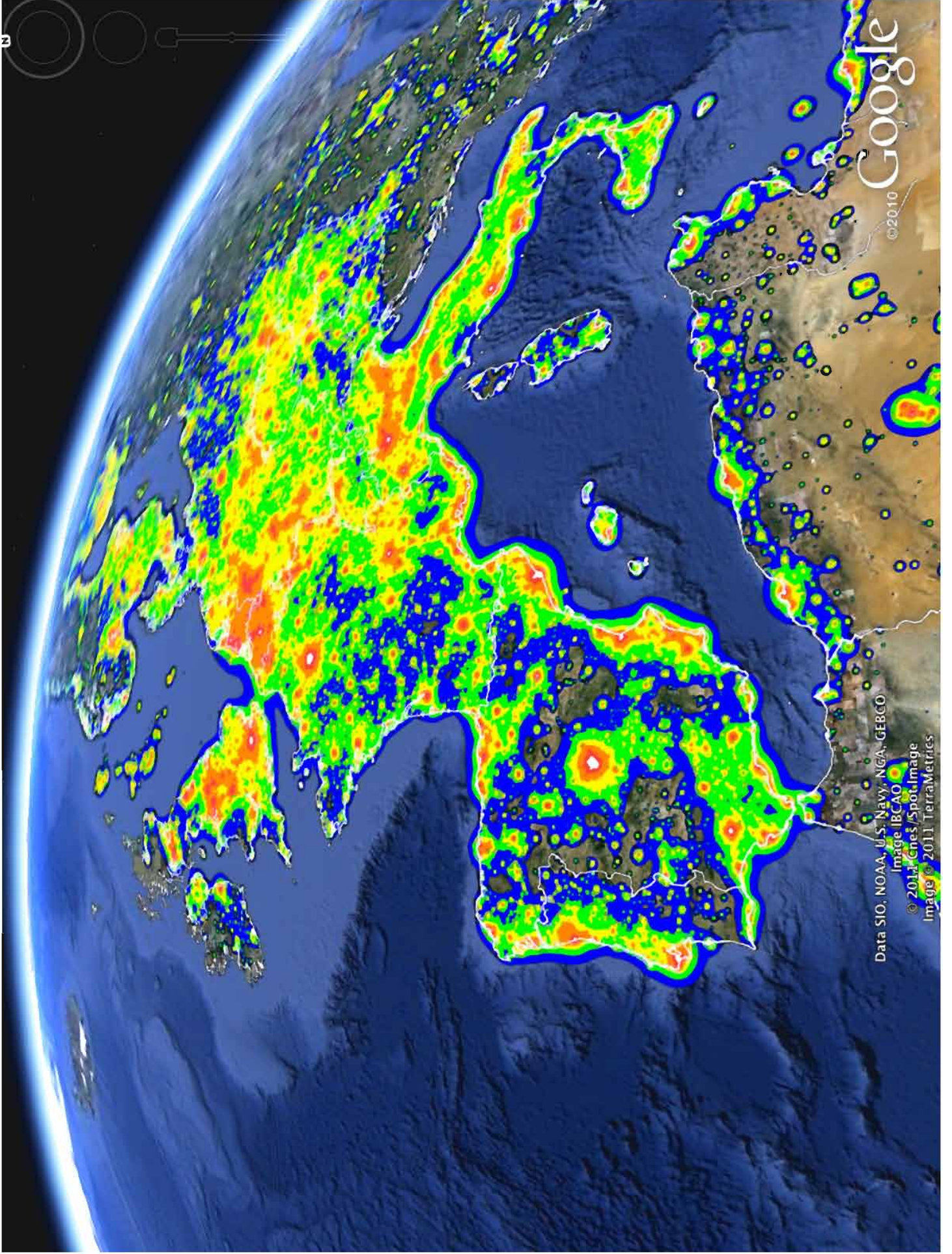


El primer Atlas sobre el brillo artificial del cielo nocturno avanzaba un problema... es esto sostenible?

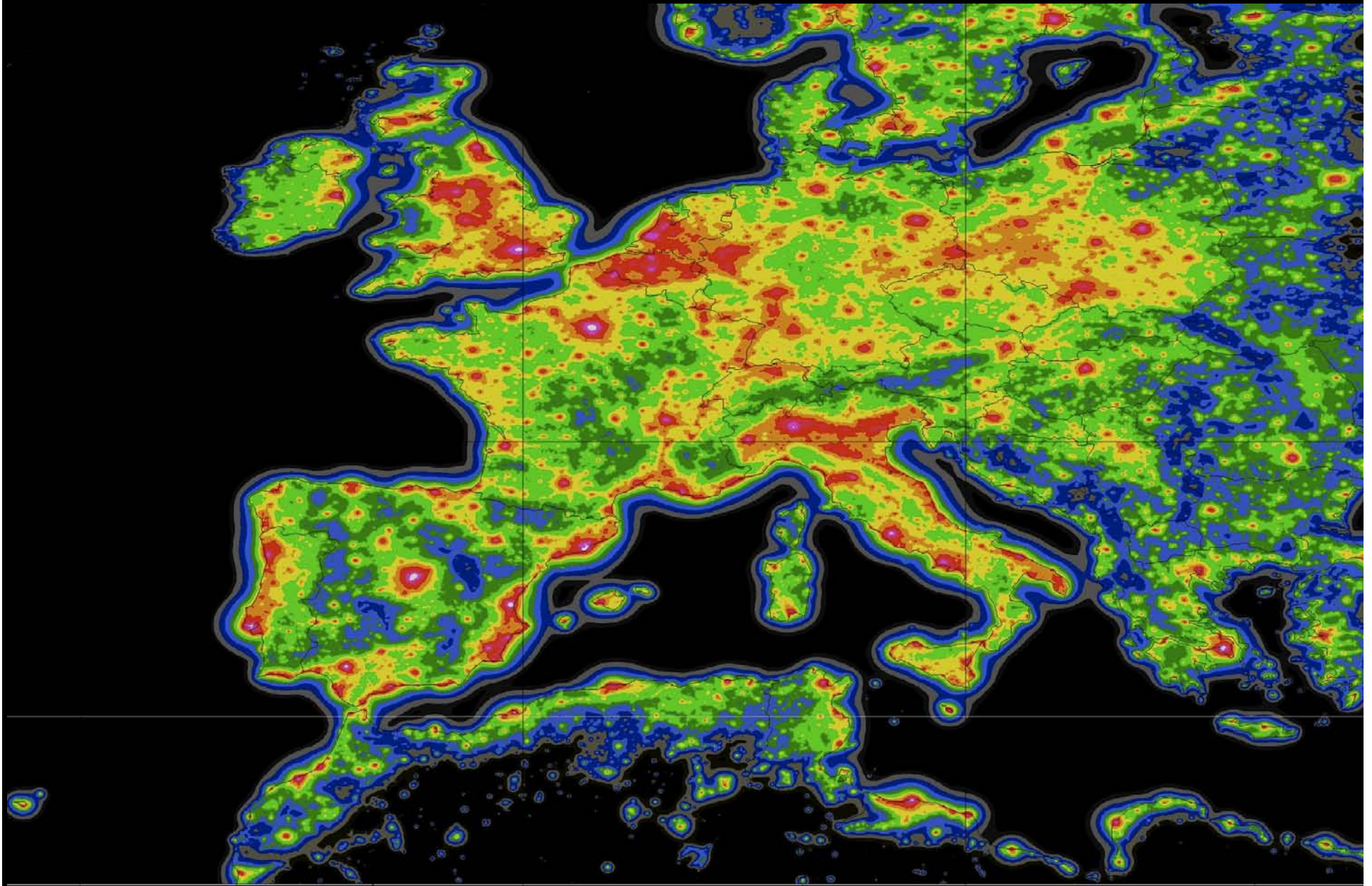
Fabio Falchi



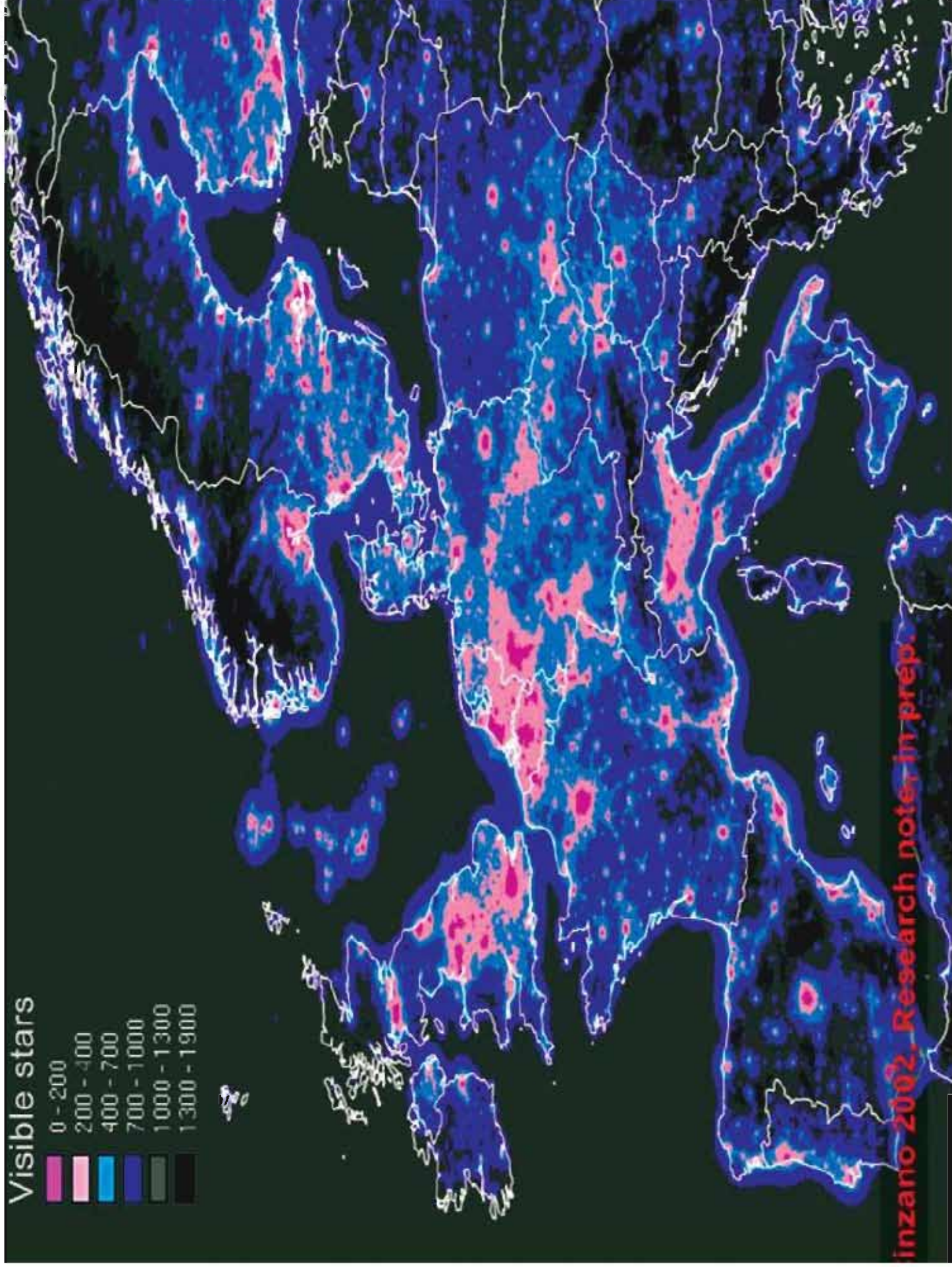
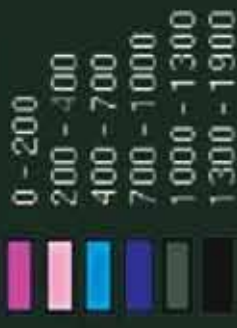
Cinzano, P., Falchi, F., Elvidge, C.D. 2001, Monthly Notices of the Royal Astronomical Society, Volume 328, 689-707



Segundo Atlas

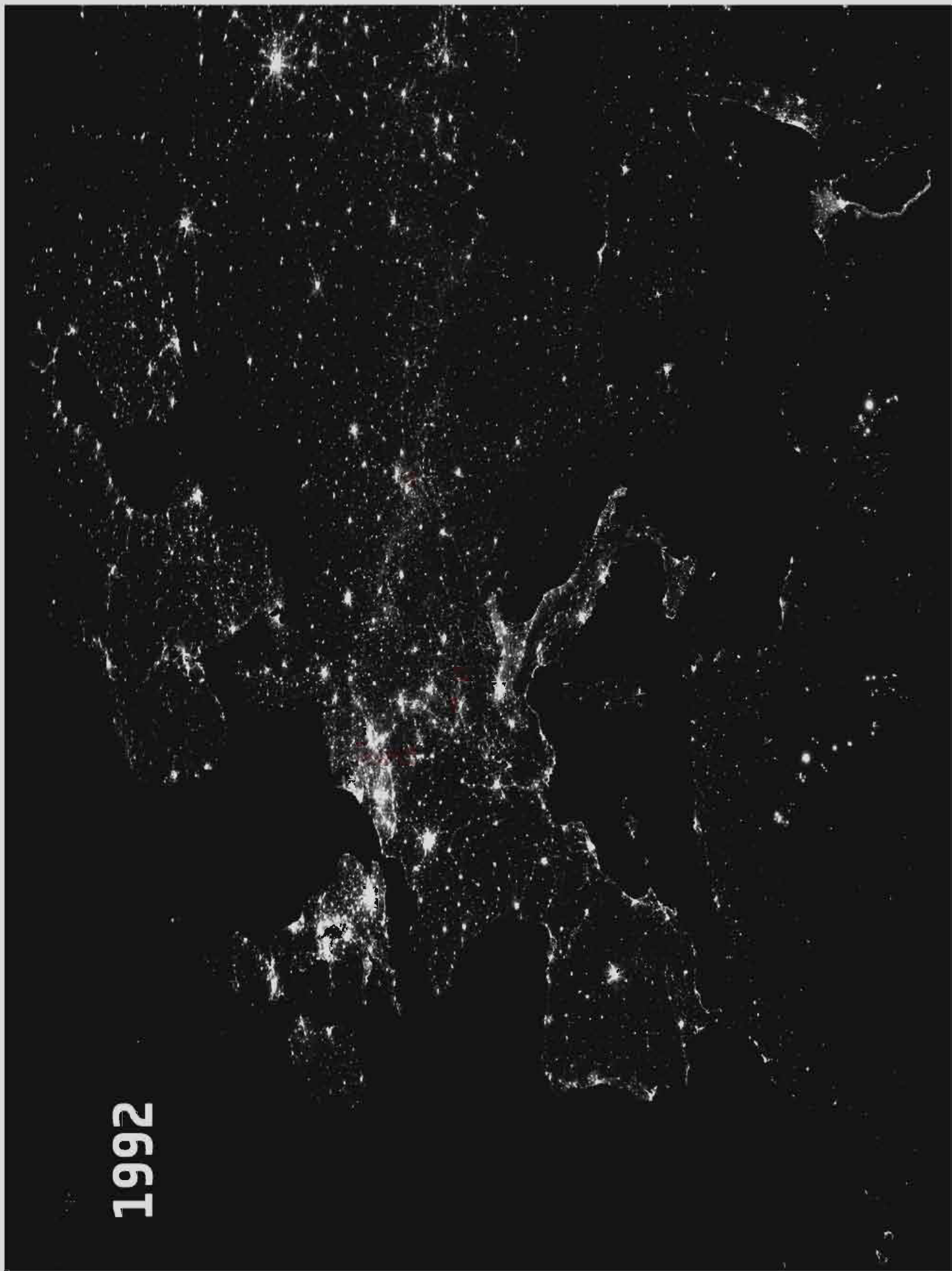


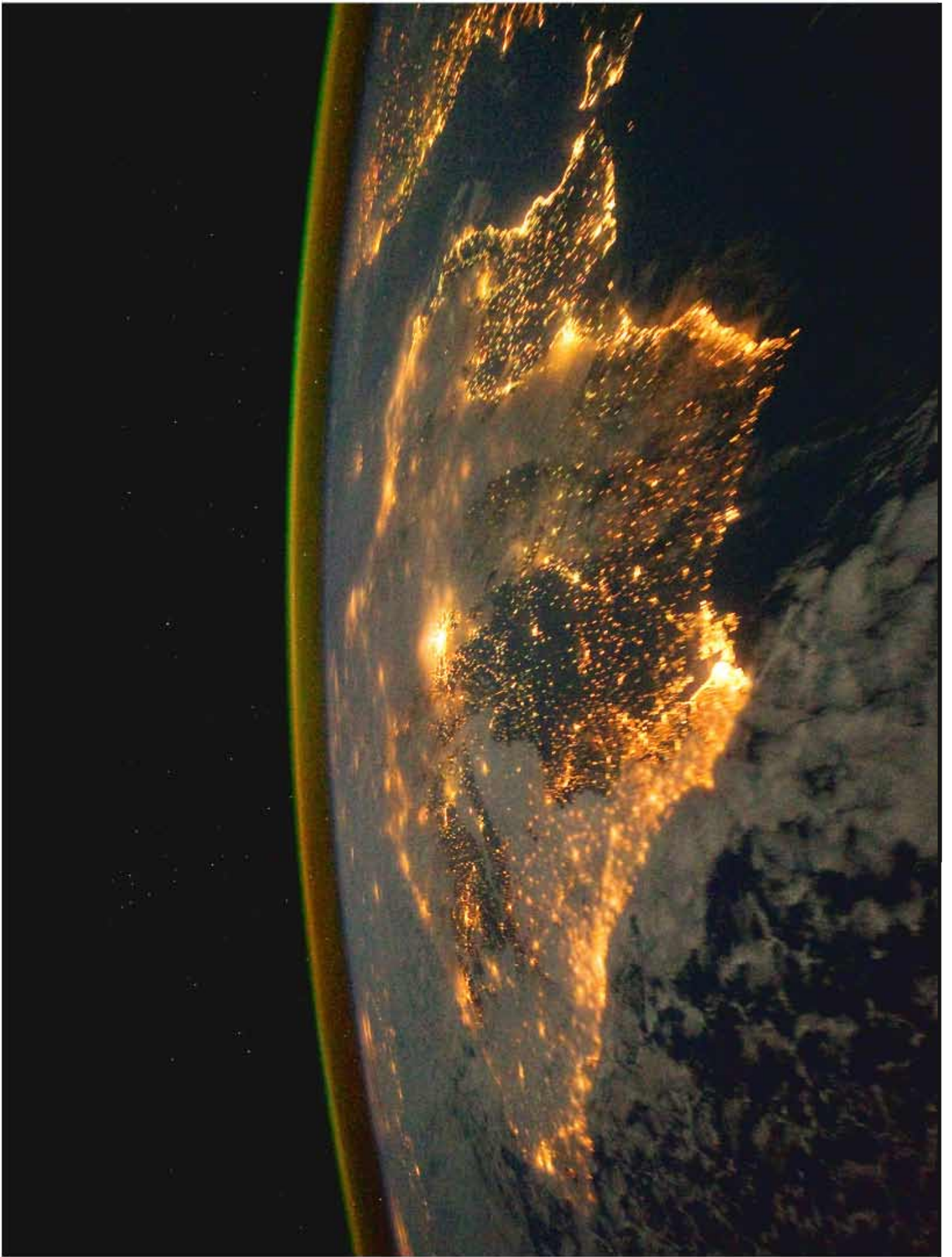
Visible stars



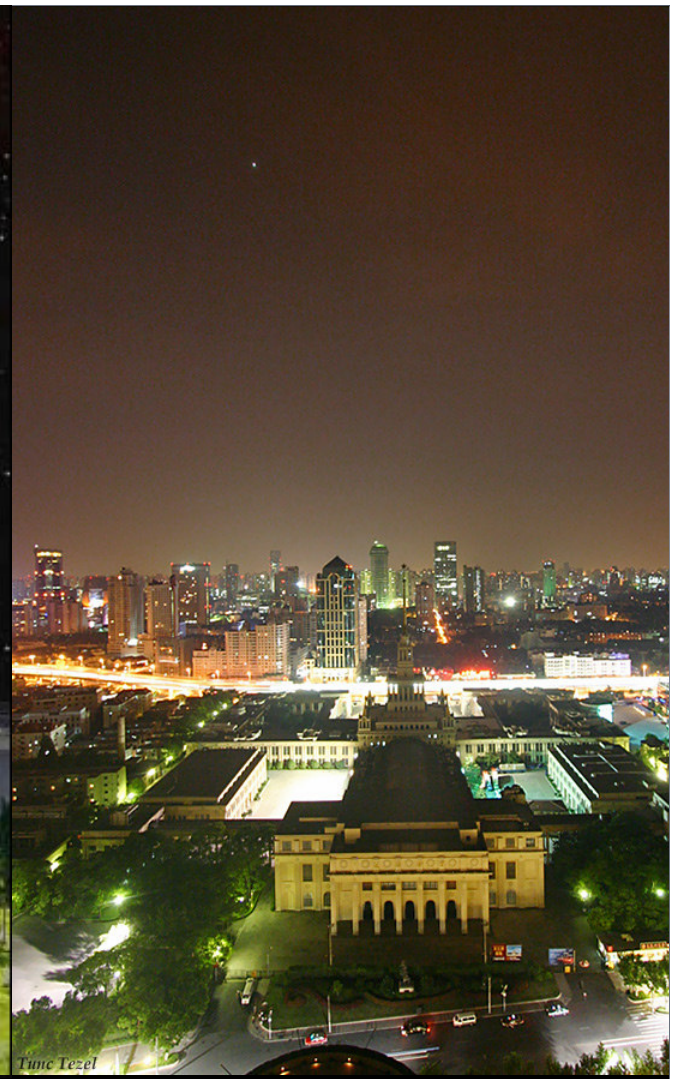
inzano 2002. Research note, in prep.

1992





Starlight Involución



El cielo, nuestra herencia común y universal, es una parte integral del ambiente percibido por la humanidad. La Humanidad ha observado siempre el cielo para interpretarlo o para entender las leyes físicas que gobiernan el universo.

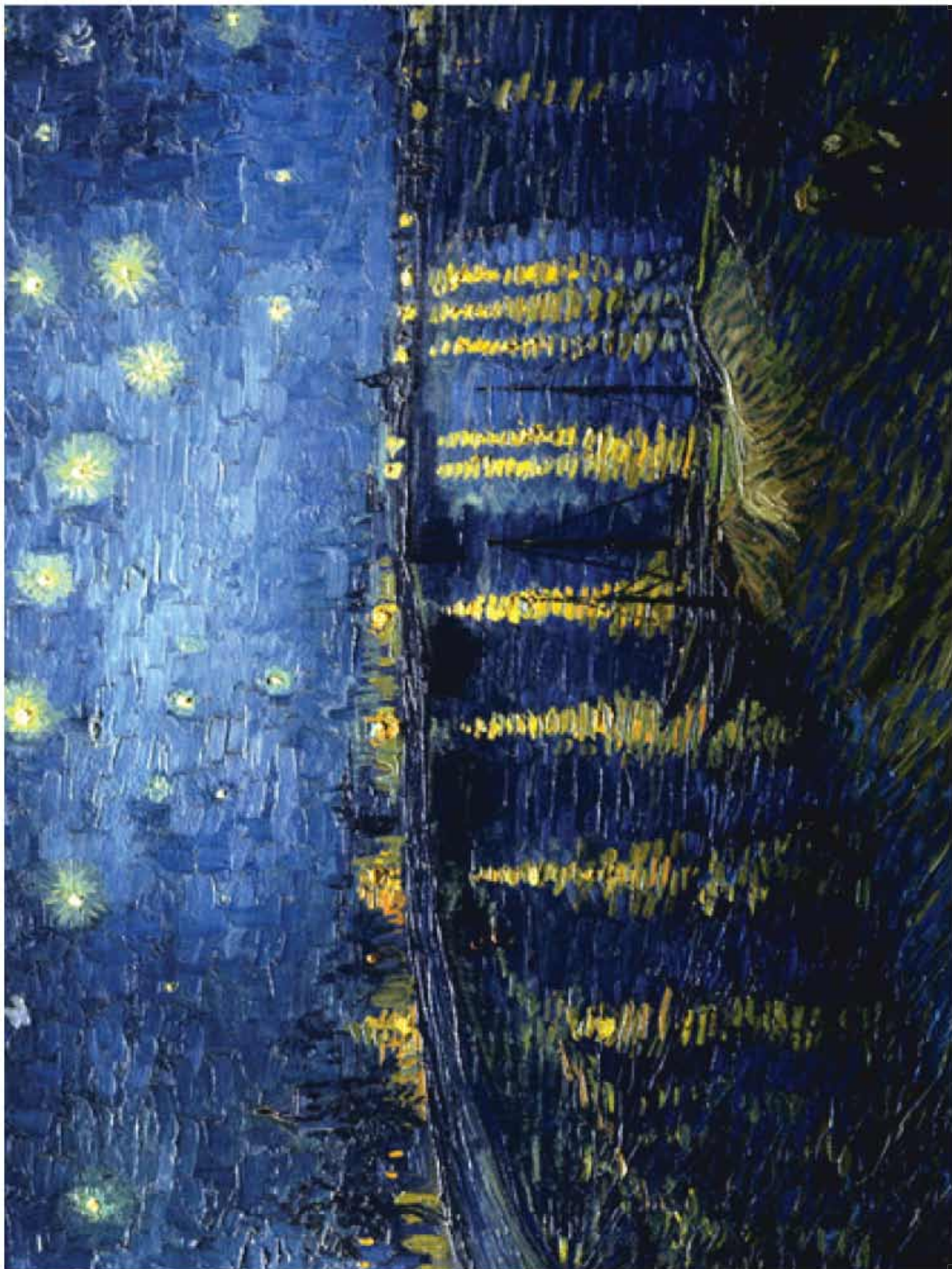




whiti mai ngā whetū
Resolutions
The Third International
Starlight Conference
Lake Tekapo - New Zealand
10-13 June 2012

10 RAZONES PARA DEFENDER LA LUZ DE LAS ESTRELLAS

1. Astronomía, profesional y amateur
2. Integridad ecológica
3. Eficiencia energética
4. Prácticas culturales, arte, inspiración y espiritualidad
5. Patrimonio cultural tangible e intangible
6. Apreciación y belleza del paisaje
7. Experiencias en la naturaleza
8. Turismo Starlight
9. Salud
10. Seguridad y bienestar



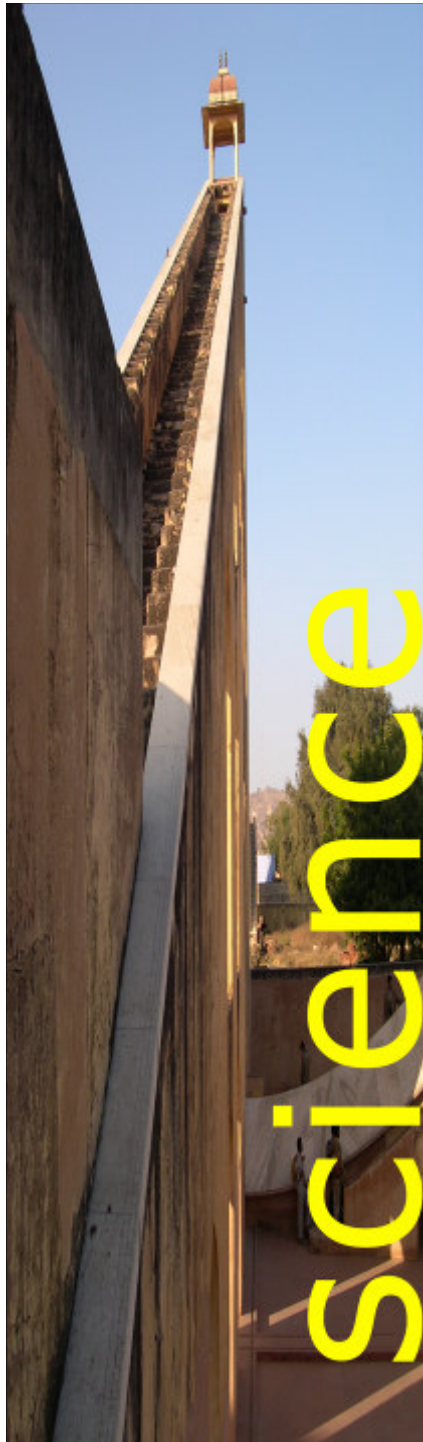


Dimensión Cultural

Cultural Dimension







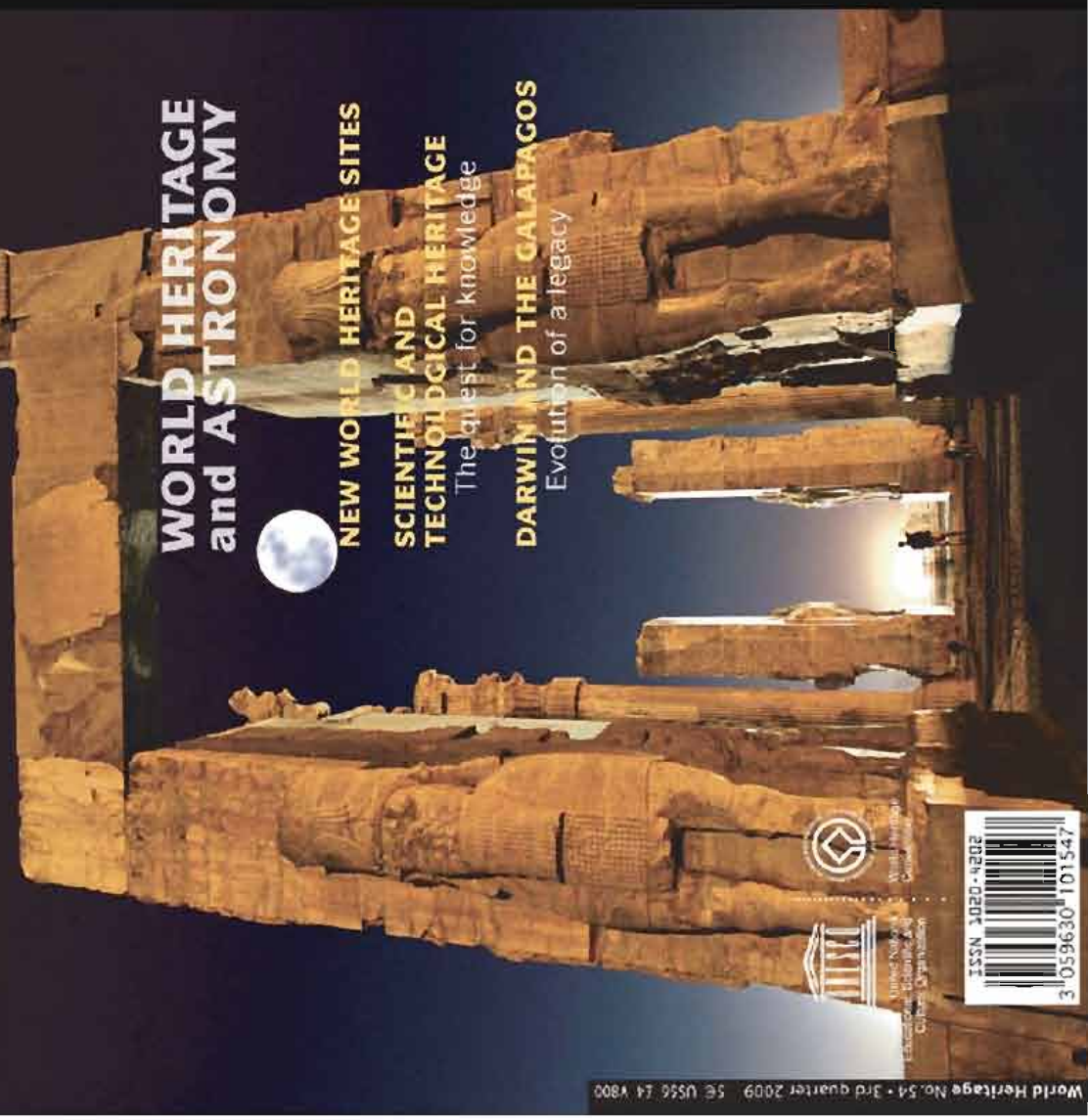
UNESCO
World Heritage Centre



Initiative
Astronomy
and
World Heritage



WORLD HERITAGE



WORLD HERITAGE and ASTRONOMY



NEW WORLD HERITAGE SITES

SCIENTIFIC AND TECHNOLOGICAL HERITAGE

The quest for knowledge

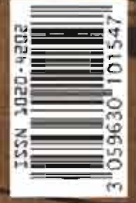
DARWIN AND THE GALAPAGOS

Evolution of a legacy

World Heritage No. 51 • 3rd quarter 2009 SE US\$6 £4 800



United Nations
Educational, Scientific and
Cultural Organization



W Focus Astronomy and World Heritage

Astronomy and World Heritage

Alan Hoggan,
Senior Professor of Environmental Science, University of Exeter, UK
and Director of the Centre for Astronomy and World Heritage

Astronomical heritage – cultural heritage relating to the sky – is a significant part of the cultural heritage of every human culture, but for most of human existence in the past it formed a common and immutable part of the observed world. Its repeated cycles leading to regulate human activity as people strove to make sense of their world and keep their activities in harmony with the cosmos, as they perceived it. In some cases this was simply in order to maintain seasonal subsistence cycles, in others it helped to support dominant ideologies and complex understandings. In the past it was a source of common understanding, but in the modern world it is the most clearly links people with an active interest in the skies right through from the earliest skywatchers to modern astronomers and cosmologists.

UNESCO COURTESY ICH/ICOMOS/ICAHN/ICP/ICR/ICP/ICR

6

In Focus: Starlight Reserves

Starlight Reserves and World Heritage: Scientific, cultural and environmental values

Christine Mack, Co-ordinator of the Starlight Reserves and Starlight Reserves, Institute of the Stars and Planets, University of Exeter, UK

Point 1 of the Declaration in Defence of the Night Sky and the Right to Starlight, adopted in 2007 at the Starlight Reserves Conference in Exeter, states that wherever there is a degradation and loss of the night sky there should be considered an inalienable right of humankind equivalent to all other environmental, social and cultural rights.... This view highlights the fact that a so far unthought right is now in serious danger and that its degradation will lead to the irretrievable loss or neglect of an extensive associated cultural, scientific, scenic and natural heritage.

UNESCO COURTESY ICH/ICOMOS/ICAHN/ICP/ICR/ICP/ICR

34

ICOMOS
international council on monuments and sites



Heritage Sites of Astronomy in the and Archaeoastronomy in the context of the UNESCO World Heritage Convention

A Thematic Study

June 2010



International Council on
Monuments and Sites
Conseil International
des Monuments et des Sites



Published by ICOMOS

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49-51 rue de la Fédération, F-75015 Paris, France

and the International Astronomical Union

IAU-UI Secretariat,
98-bis Blvd Arago, F-75014 Paris, France

ISBN: 978-2-918086-01-7 (e-book)

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Stonehenge. © UNESCO / Francesco Bandito
Ulugh Beg's Observatory, Uzbekistan. © Our Place, the World Heritage Collection
The McClean Building at Cape Observatory, South Africa. © Ian Glass
The Caracol at Chichen Itza, Mexico. © Emmanuel Privat

Supported by



Instituto de Astrofísica de Canarias (IAC) and Starlight Initiative
C/ Via Látexa, s/n. E-38205 La Laguna (Tenerife), Spain



United Nations
Educational, Scientific and
Cultural Organization



International Astronomical
Union



World Heritage
Centre

Portal to the Heritage of Astronomy

User Name:

Search...

Home About Themes The Heritage Community Resources



Start above image: Mount Teide in Tenerife, Canary Islands. Copyright: Jean-Claude Casalis, TWAN (TWAN.org)

Welcome to the new integrated web portal for the Astronomy and World Heritage Initiative. Following the 'professional launch' on March 28, 2012, we encourage professional users to register and log in to trial the heritage finder, editing and forum facilities. The public launch will take place on August 24, 2012, during the sessions of the IAU's Astronomy and World Heritage Working Group at the 28th IAU General Assembly in Beijing, China.

What is astronomical heritage?



Why preserve it?
What is the purpose of this web portal?

Categories of astronomical heritage



Tangible fixed



Tangible movable



NATURAL

CULTURAL
 Knowledge and ideas

Landscape and sites

Astronomical Heritage Finder

This search window allows logged-in users to locate Astronomical Heritage entities geographically and/or temporally.



Preview of the Astronomical Heritage Finder...

World heritage and astronomy




Science and technology heritage

UNESCO's Astronomy and World Heritage Initiative exists to help identify, safeguard and promote cultural heritage associated with

News and forthcoming events



The Third International Starlight Conference will take place at Lake Tokapo, New Zealand on 11-13 June 2012. The meeting will discuss progress towards creating and maintaining Starlight Reserves in the light of the ICOMOS-IAU Thematic Study.

Thematic Study

The ICOMOS-IAU Thematic Study on the Heritage Sites of Astronomy, published in 2010, forms the starting point for much of the content of this portal.

[Read more](#)

Events

April 2012						
Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Our sponsors



International Astronomical Union



Royal Astronomical Society

Collaborating projects



Starlight Initiative



The World at Night (TWAN)



FINDER

[Home](#)[Starlight Initiative](#)[Portal to the Heritage of Astronomy](#)[IUCN DSAG](#)[SL Forum](#)[Resources](#)

Documents - Featured

-  [The Sky Law - Canary Islands, Spain \(1988\) \(16\) \(The Right to Starlight\)](#)
-  [Ecological Consequences of Artificial Night Lighting \(15\) \(Light Pollution and Environment\)](#)
-  [An assessment of current knowledge concerning light pollution a risk factor for breast cancer \(2010\) \(11\) \(Light Pollution and Health\)](#)
-  [Preserving the Dark: Advocating Against Light Pollution at the American Medical Association \(11\) \(Light Pollution and Health\)](#)
-  [Light pollution and its effect on Yellowan Shearwaters in Malia: causes and solutions \(2007\) \(8\) \(Light Pollution and Environment\)](#)

Welcome to the Starlight Finder

Starlightfinder is an instrument designed to provide the necessary knowledge resources to defend the quality of the night sky as a scientific, cultural, and environmental resource at risk.

The recovery of the stary sky is a continuous task that concerns everyone: educators, the scientific community, public administrations, international organizations, and all actors of the civil society, following the principles and recommendations of the Starlight Declaration of 2007.

Portal of the Starlight Initiative

The final aim of the **Starlight Initiative** is to strengthen the importance of clear skies for humankind, emphasizing and introducing the value

Portal to the Heritage of Astronomy

Following the Starlight meeting held in La Palma in November 2009, members of the IAU **Working Group Astronomy**

IUCN Dark Sky Advisory Group

The Final Report of the **Starlight Reserves Working Group** (Fuereventura, 2009) include "the establishment of a dark sky advisory group within the

Windows to the Universe

Heritage of Astronomy

Destinations under the Stars

Pre-registration for Starlight Certification

Natural Areas

Protecting Biodiversity at night

World List of Dark Sky Parks

Cities under the Starlight

Benchmark of excellence

Laws and Regulations

Light pollution control



Ventanas al Universo



UNESCO World Heritage Convention

Article 1 of the Convention defines

“natural sites or precisely delineated natural areas of outstanding universal value from the point of **view of science**, conservation or natural beauty”

Useful Time (of clear sky)+sky background (darkness)+Atmospheric Extinction (transparency)+Seeing (for sharp images)





Chapter 16: Windows to the Universe: Starlight Areas and Observatory Sites

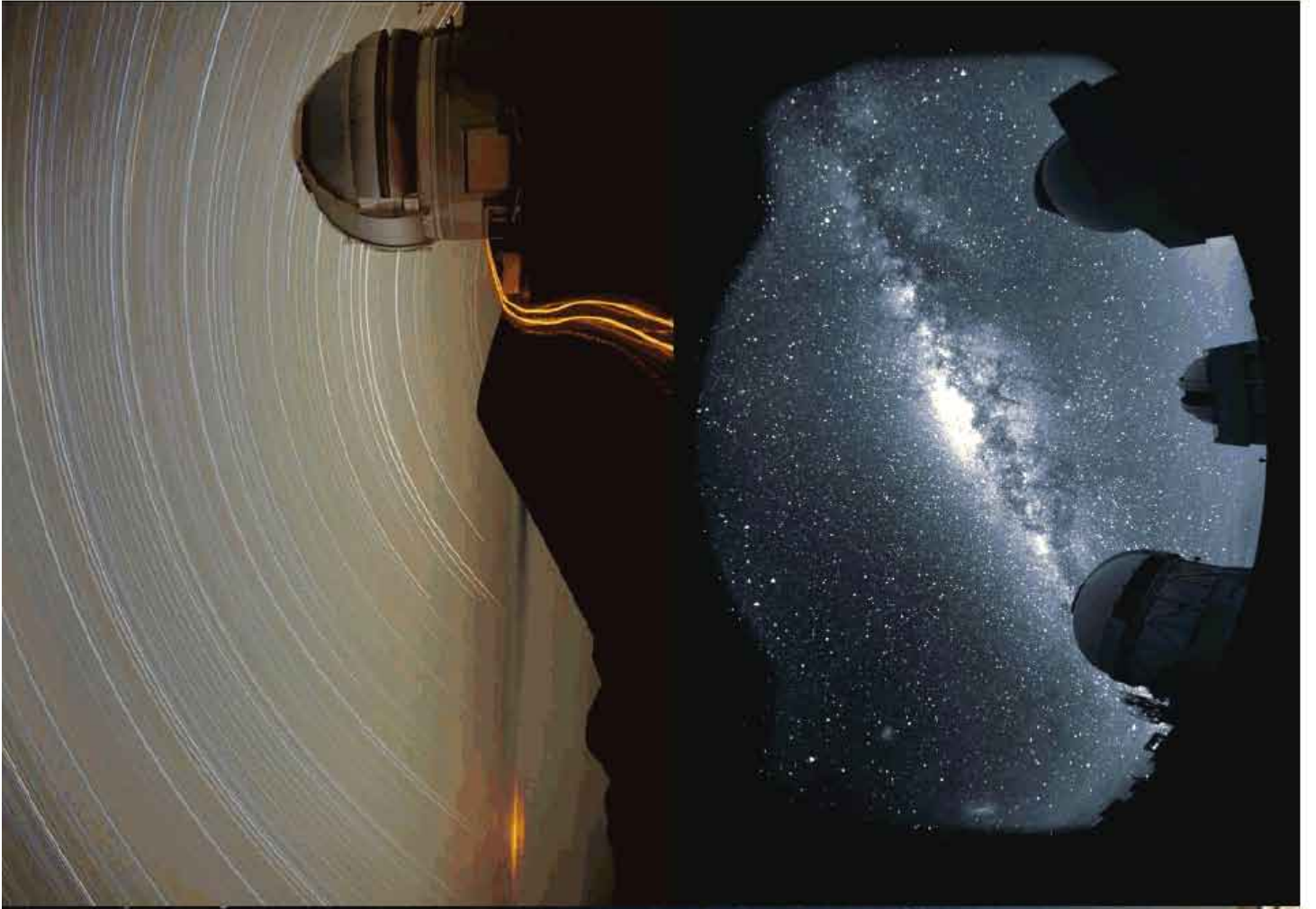


Casos de Estudio

- AURA Observatory, Chile (Cerro Tololo – Cerro Pachón), Chile
- Mauna Kea Observatory, Hawaii, USA
- Canarian Observatories (Teide, ORM-La Palma), Spain.

Paisajes Naturales y Culturales

- Lake Tekapo – Aoraki – Mount Cook Starlight Reserve, New Zealand.
- Eastern Alpine Starlight Reserve and Großmugl Starlight Oasis, Austria.



Paisajes del cielo estrellado





COUNCIL OF EUROPE
CONSEIL DE L'EUROPE



EUROPEAN LANDSCAPE CONVENTION
CONVENTION EUROPEENNE DU PAYSAGE



SWEDISH NATIONAL HERITAGE BOARD
RIKSANTIKVÄRDEÄMBETET

EUROPEAN LANDSCAPE CONVENTION Florence Convention

EIGHT COUNCIL OF EUROPE MEETING OF THE WORKSHOPS FOR THE IMPLEMENTATION OF THE EUROPEAN LANDSCAPE CONVENTION

Being held in association with the Swedish EU presidency in autumn 2009

PROGRAMME (22 Juni 2009)

Landscape and driving forces

Malmö/Alnarp, Sweden, 8 – 9 October 2009
Swedish University of Agricultural Sciences

Study visit, 10 October 2009



Photo: Sverker Svensson

Document by the Cultural Heritage, Landscape and Spatial Planning Divisions of the Council of Europe





Wally Pacholka

Arches National Park – Skyscape



Sequoia National Park



Lago Tekapo – NEW ZEALAND – Starlight Reserve



Fuerteventura – Montaña Tindaya



Biodiversidad en la Noche





Luz de las estrellas y vida

La luz natural de la noche resulta indispensable para el sano funcionamiento de multitud de organismos y ecosistemas. Por lo general se olvida que la vida se mantiene las 24 horas del día y que durante millones de años de evolución, los ecosistemas se han adaptado a los ritmos naturales de la luna y las estrellas.

Contaminación Lumínica



Contaminación Lumínica
Astronómica

Contaminación Lumínica
Ecológica





SITIOS STARLIGHT

Ventanas al Universo

Reservas Starlight

Destinos Turísticos Starlight

Parques Estelares (Star Parks)

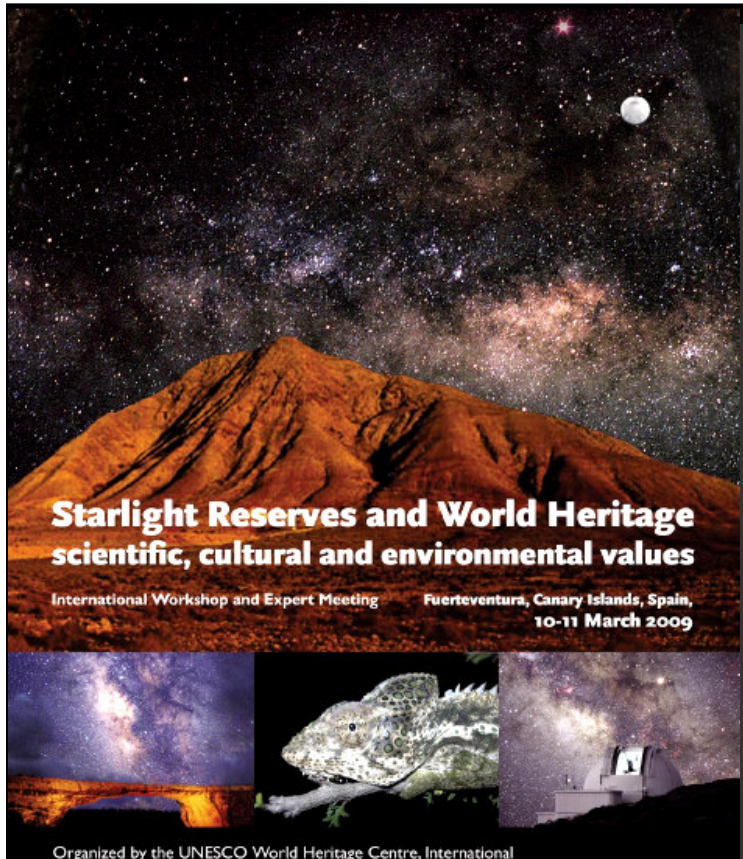
PARÁMETROS DE CALIDAD DEL CIELO

Nubosidad (cielo despejado)
Oscuridad del cielo (nivel de brillo)
Nitidez ("seeing")
Transparencia



Propuesta

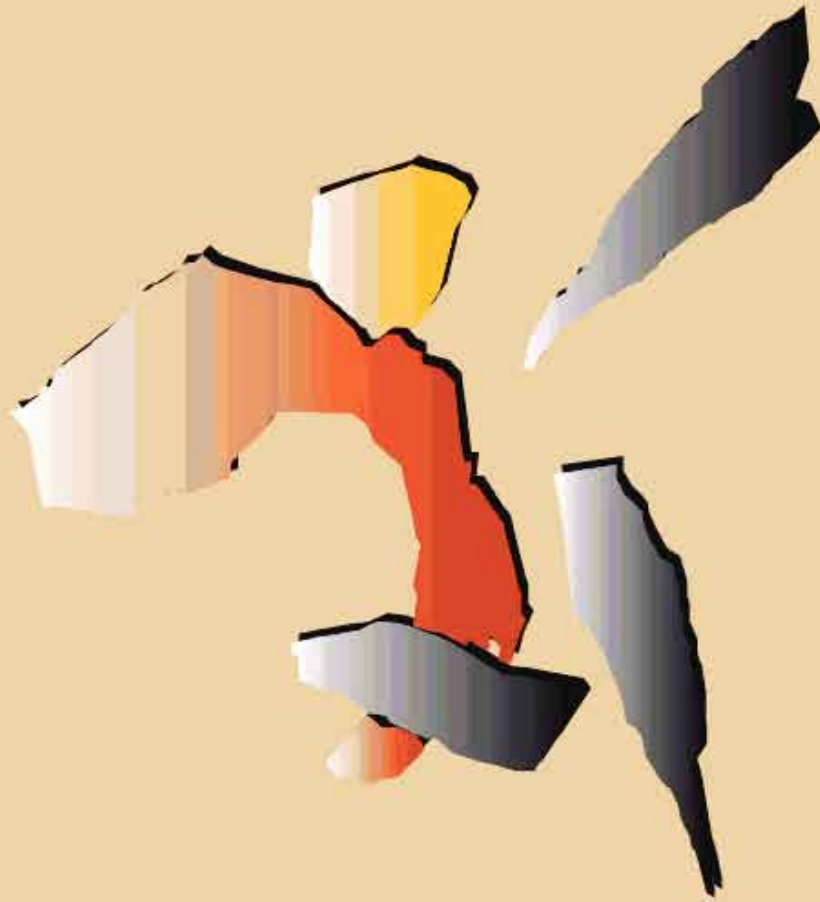
Valores asociados
Calidad del Cielo
Iluminación inteligente y responsable
Plan de Acción
Criterios y Requisitos específicos por categoría



El “Starlight Reserve Concept” was developed in collaboration with UNESCO. Applies particularly to Biosphere Reserves, Geoparks, and is recommended as a guideline for the World Heritage Sites.



**CARTA DEL TURISMO SOSTENIBLE
CHARTER FOR SUSTAINABLE TOURISM
CHARTRE DU TOURISME DURABLE**



CONFERENCIA MUNDIAL DE TURISMO SOSTENIBLE
WORLD CONFERENCE ON SUSTAINABLE TOURISM
CONFERENCE MONDIALE DU TOURISME DURABLE

LANZAROTE
ISLAS CANARIAS
ESPAÑA



Advancing Knowledge Advancing



FORUM 1-3 JUNE 2011

VILAMOURA | ALGARVE | PORTUGAL

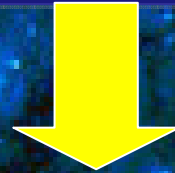
**Tourism
and Science**
Bridging Theory and Practice

TURISMO CIENTÍFICO

CIENCIA como PRODUCTO TURÍSTICO



ASTRONOMIA
CIENCIAS DE LA TIERRA



La Astronomía como **elemento transversal** de la humanidad a través de todas las culturas y países

La Astronomía **punto de partida de la ciencia** para muchas culturas

La observación en la noche para el conocimiento de especies y fenómenos naturales

RECURSOS Y SEGMENTOS TURÍSTICOS

Recursos Naturales – Turismo de Naturaleza

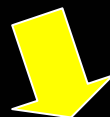
Recursos Culturales – Turismo Cultura

Recursos ... - Turismo ...

¿RECURSOS CIENTÍFICOS?



**TURISMO
CIENTÍFICO**



**TURISMO
INTELIGENTE**



Astrotur

Destinos Turísticos Starlight

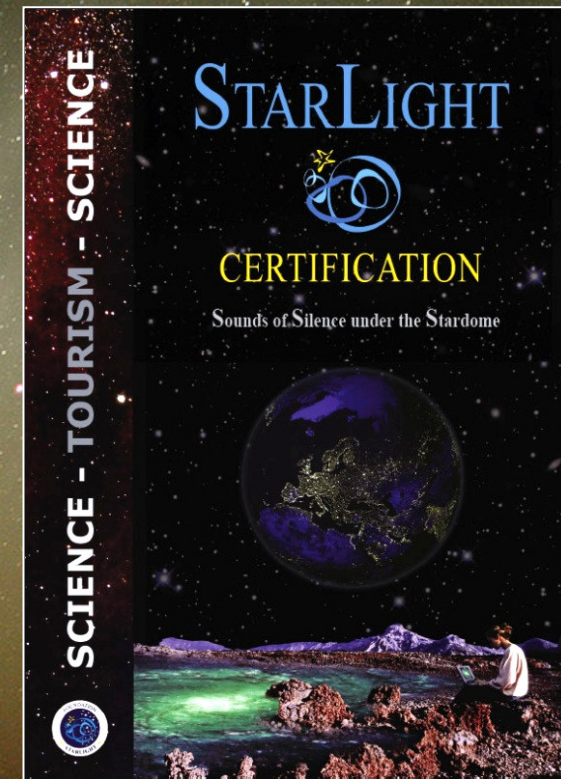
Lugares visitables que poseen excelentes cualidades para la contemplación de los cielos estrellados y la práctica de actividades turísticas basadas en ese recurso.



Certificación Starlight

La Certificación Starlight persigue garantizar la capacidad de disfrutar de la visión de las estrellas y de conocer los valores científicos, culturales, naturales y paisajísticos asociados.

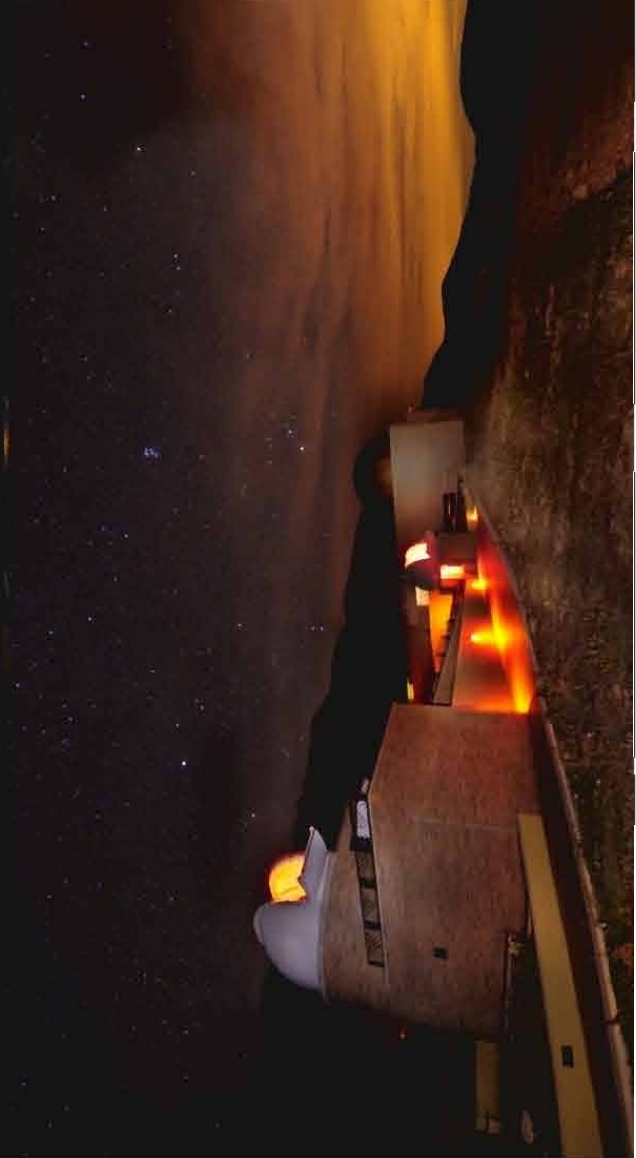
La Certificación Starlight permite por primera vez aunar la ciencia y el turismo, basando en la astronomía y la visión del firmamento una nueva forma de turismo inteligente que aporta criterios innovadores para el desarrollo responsable de la actividad.





Antonio Alvarado

VIÑA TONDONIA





RAPA NUI





www.starsislandlapalma.com



Stars Island La Palma, el mejor Cielo del Mundo.

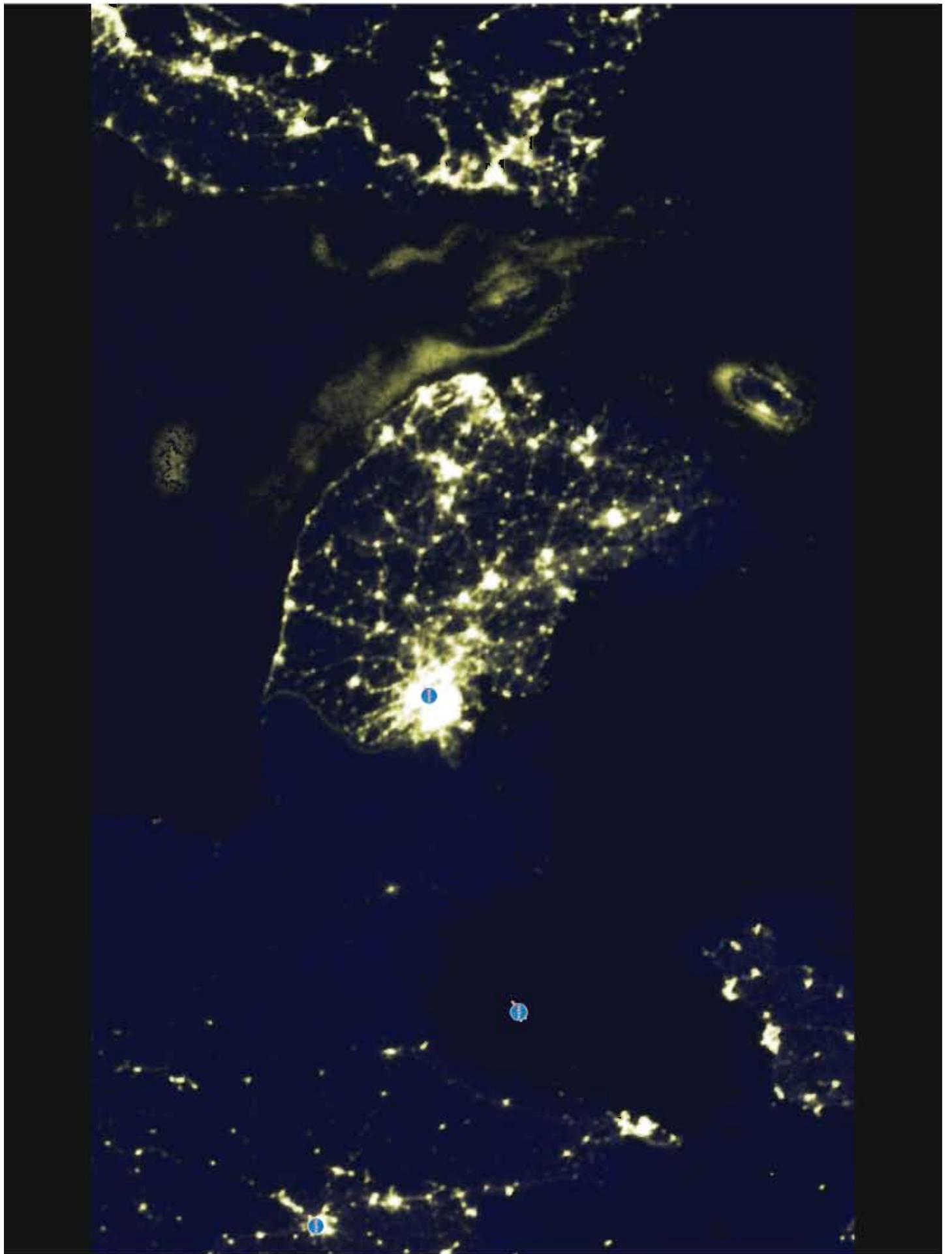
El Premio al Consumidor Inmóvil, Acumulativo de la Palma. - Turismo Las Islas Baleares - Ayuntamiento de Cultura y Patrimonio - Ayuntamiento de Turismo - 2019



Iluminación Inteligente

Save Energy
Commitment to Action on Climate Change





Biosphere Smart



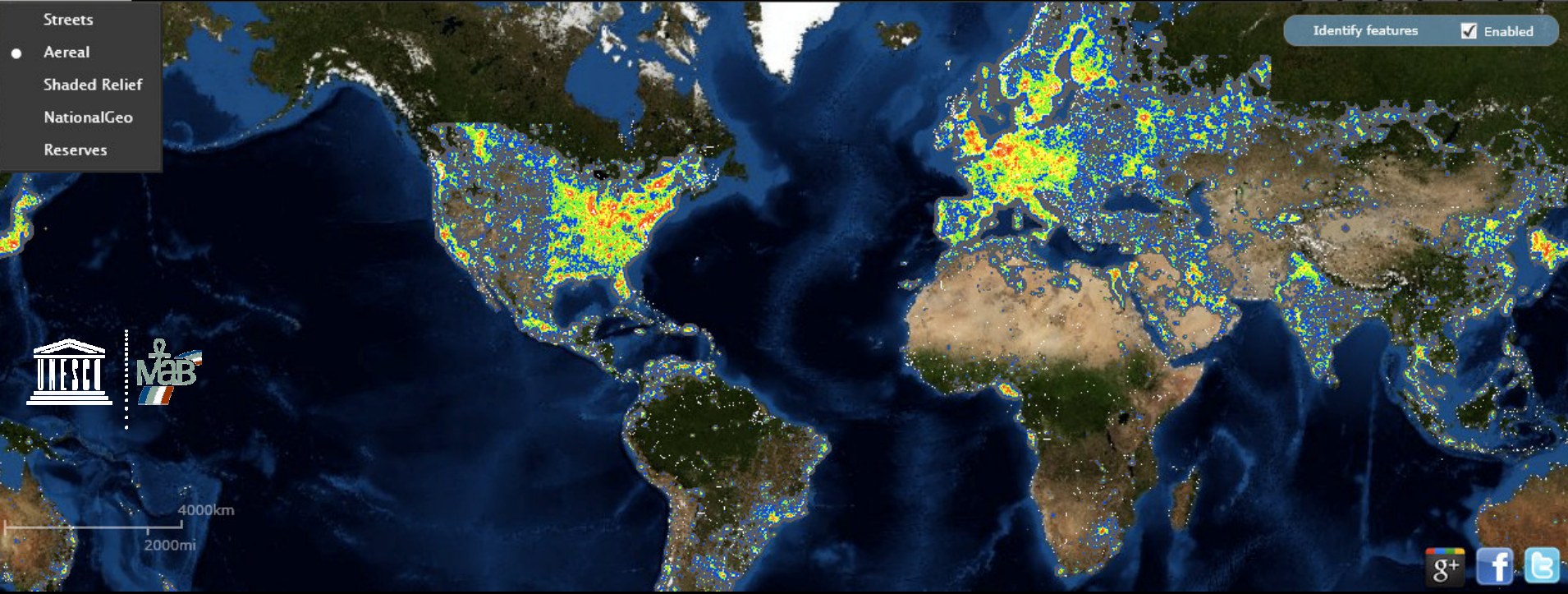
195.76.147.227:8081/ESRViewer/default.html

Instituto Cervantes RBDigital - Visor de

BiosphereSMART GREEN ECONOMY AND SUSTAINABLE DEVELOPMENT

- Base Maps
- Thematic Maps
- Climate Change
- Global Change
- Biosphere Reserves
- Green Economies

- Streets
- Aerial
- Shaded Relief
- NationalGeo
- Reserves



Biopsphere Smart



195.76.147.227:8081/ESRIviewer/default.html

Instituto Cervantes RBDigital - Visor de

BiosphereSMART GREEN ECONOMY AND SUSTAINABLE DEVELOPMENT

Base Maps Thematic Maps **Climate Change** Global Change Biosphere Reserves Green Economies

- K-G Climate Classification
- Mean Temperature
- Precipitation patterns
- Solar radiation
- Sea level rise
- Greenhouse gas emission

Identify features Enabled

400km
200mi



**STARLIGHT
OFFICIAL EVENTS OF THE EUROPEAN
SUSTAINABLE ENERGY WEEK**

April 11th, 11:30 h

Presentation and public events

*The Amalfi coast towards the use of alternative
energy and the defence of the starry sky*

Organises: Associazione Costiera Amalfitana

Riserva della Biosfera ONLUS

Venue: Vietri sul Mare, Amalfi Coast, Italy.

Save Energy and recover the Stars



With the support of:



Starlight Cities Benchmark of Excellence



Covenant
of Mayors
Committed to local
sustainable energy



OTPC
OPPC
STIL
Starlight Initiative
CIE
UNESCO

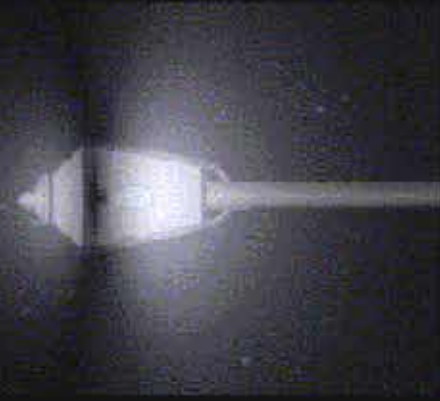
GUÍA PRÁCTICA DE ILUMINACIÓN DE EXTERIORES:

Alumbrado eficiente y control de la
contaminación lumínica.



OPCC-OTPC

OFICINAS DE PROTECCIÓN DE LA CALIDAD DEL CIELO DE CHILE Y CANARIAS



Effect on Skyglow and cut-off angle¹⁹

Diagram to show relative impact of a luminaire's output contribution to skyglow.

- E 120-180° Critical area for skyglow experience from within urban and all areas but proportionally less impact to rural areas, distant from main light sources.
- D 95-120° Significant contributor to skyglow, especially in rural areas. Less likely to be obstructed.
- C 90-95° Critical zone for skyglow and obstruction seen at 10s of km (in rural areas) where it is strongly dependent on aerosol scattering.
- B 85-90° Significant contributor to skyglow seen at a distance through reflection but reflected light more likely to be obstructed by buildings, trees and topography. Produce also glare in the roadway users.
- B_{low} 75° to 85° Produce glare in the roadway users.
- A 0-75° Ideal light distribution.





Pacto de los Alcaldes

Compromiso con una energía sostenible local



Acerca de Acciones Participación Apoyo Medios de comunicación

Iniciativas relacionadas



El Pacto de los Alcaldes no es una iniciativa aislada. Al contrario, está muy vinculada a una gran variedad de proyectos, políticas e iniciativas de Instituciones, administraciones y redes públicas europeas.

Las iniciativas relacionadas con el Pacto se clasifican en tres tipos:

- INSTITUCIONES, POLÍTICAS e INICIATIVAS COMUNITARIAS-;
- EVENTOS Y CAMPAÑAS HABITUALES EN LA UE;
- REDES DE CIUDADES Y REGIONES, ASOCIACIONES E INICIATIVAS.

EU INSTITUTIONS, POLICIES and INITIATIVES



DG ENER



The webpage of the Alpine Convention on Climate Change has the purpose to contribute to the implementation of the Action Plan on Climate Change in the Alps adopted in March 2009 by the Contracting Parties of the Alpine Convention. The Alpine States have agreed that the time has come to act collectively and at a large scale to make the Alpine region a model region regarding the problem of climate change, and this website shall be an interactive tool to support this objective. The site proposes reference texts, relevant publications and bibliographies, as well as a "knowledge centre", which recollects useful addresses of the main actors at local and regional level supporting or carrying concrete measures on climate change. The Good Practice and the News & Events windows allow the actors on the field to submit their experiences and share their initiatives regarding climate action in the Alps.

[Visit the site](#)



The Starlight Initiative

The Starlight Initiative is designed as an international action in defence of the quality of night sky and its associated values. One of the main actions within the Initiative is the development of a network of Starlight Cities and Municipalities as sites that promote intelligent outdoor lighting with the double function of saving energy and recovering the starry sky.

The Starlight Initiative aims to fight against the harmful effects of light pollution that is a growing problem in our cities and municipalities. The waste of outdoor lighting increases energy consumption and is economically unjustified. It also increases the level of emitters that contribute to climate change.

Starlight Cities and Municipalities will commit to:

- promote and replicate best practices in cities' outdoor lighting, aiming to increase energy efficiency of 20% at least, and to decrease light pollution of no less than 20%.
 - disseminate successful ordinances and regulations on responsible outdoor lighting among local authorities.
 - promote sustainable lighting plans respectful of night sky quality and energy efficiency.
 - disseminate and recommend the best eco-efficient and innovative light technologies.
 - develop outreach and training actions addressed to local people, local authorities and those in charge of outdoor lighting.
 - disseminate the Practical Guide for Outdoor Lighting among the main stakeholders and local authorities.
- The Starlight Initiative relies on the support of UNESCO-MaB, IAC, IAU and other international organizations.

[Visit the site](#)



Seminario Internacional Sobre
CONTAMINACIÓN LUMÍNICA



CONCLUSIONES

Seminario Internacional de Contaminación Lumínica

Museo Desierto de Atacama, Antofagasta. 2-4 de Agosto de 2010

PUNTO 7

Advertir a nivel local, nacional e internacional sobre los efectos nocivos derivados del fuerte componente azul de algunas lámparas como las que usan amalgamas de mercurio (vapor de mercurio, vapor de mercurio con halogenuros, inducción) y las de estado sólido (LEDs) de color frío, que emiten significativamente en **longitudes de onda inferiores a 500 nm**. Estas emisiones son especialmente perjudiciales si no se corrigen con filtros u otros dispositivos, por la mayor dispersión que esa parte del espectro lumínico produce en la atmósfera (resplandor), y además provoca un incremento de los **efectos negativos sobre la biodiversidad y la salud humana**.



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SOTTOSCRIZIONE A SUPPORTO DELL' ADOZIONE DELLA DICHIARAZIONE IN DIFESA DEL CIELO NOTTURNO ED IL DIRITTO ALLA LUCE DELLE STELLE

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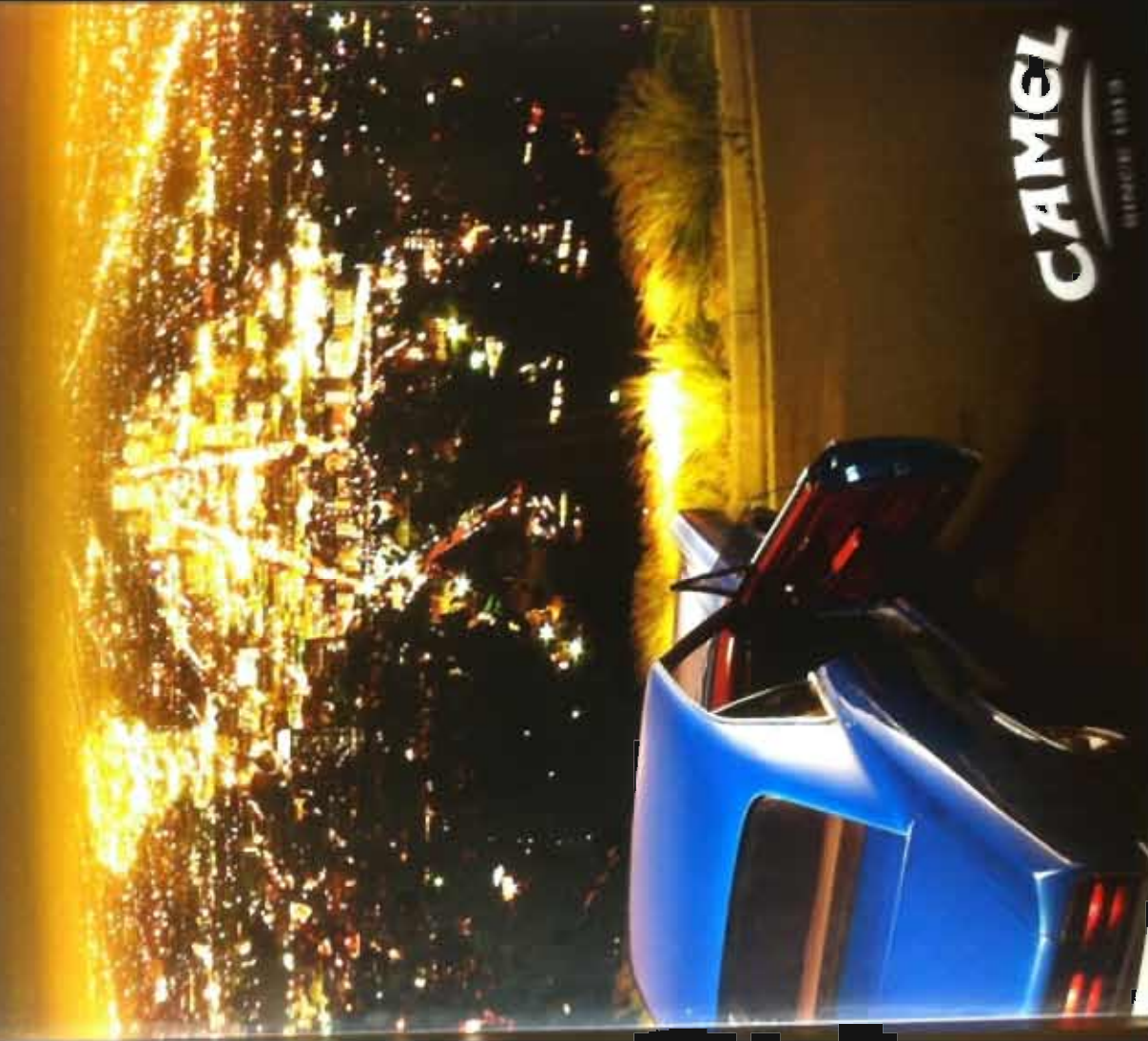
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