LIGHT- & SOUNDSCAPES OF THE URBAN NIGHT
BERLIN/FLORENCE

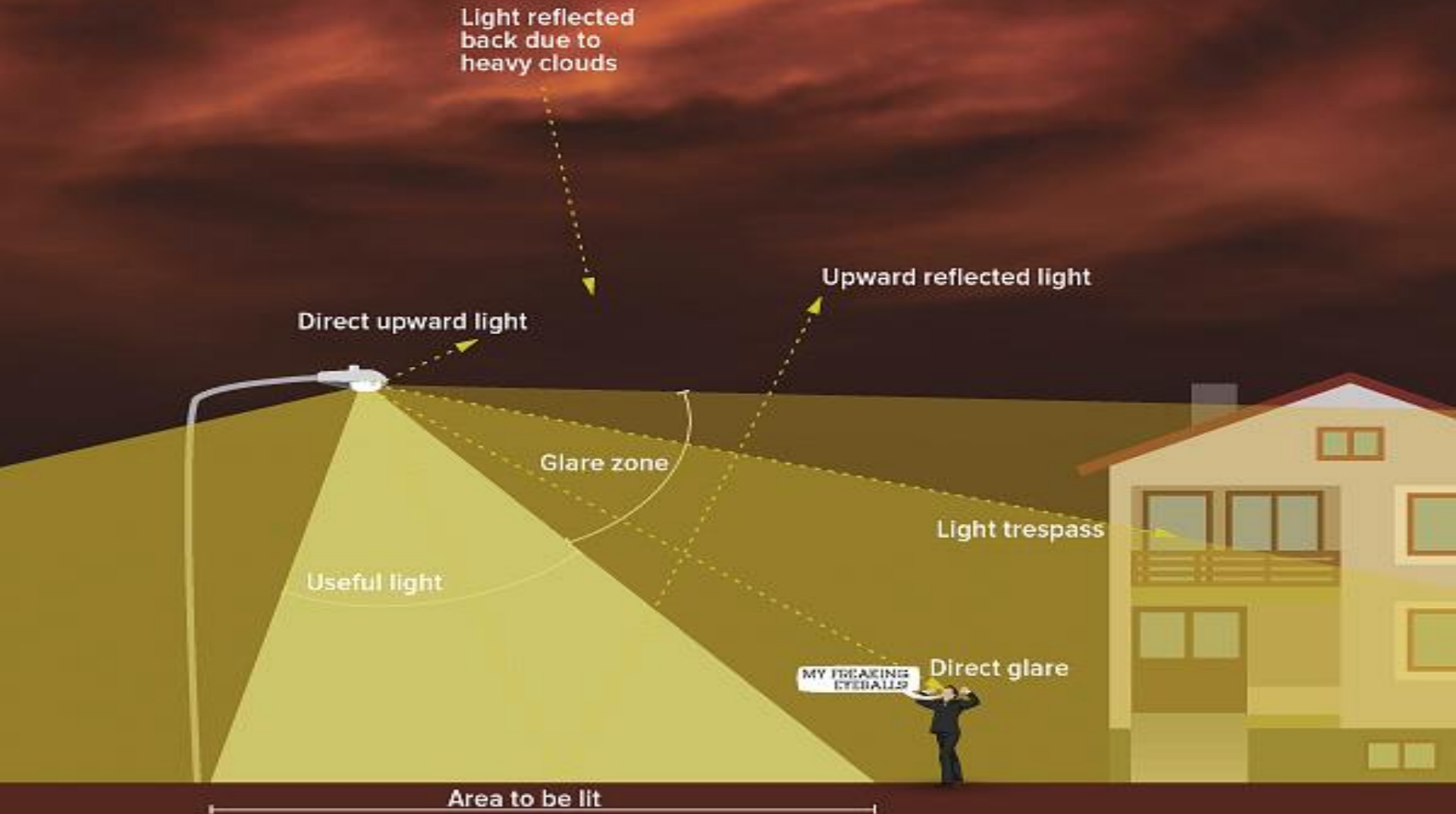**Prof. Dr. D. Henckel, Technical University of Berlin**
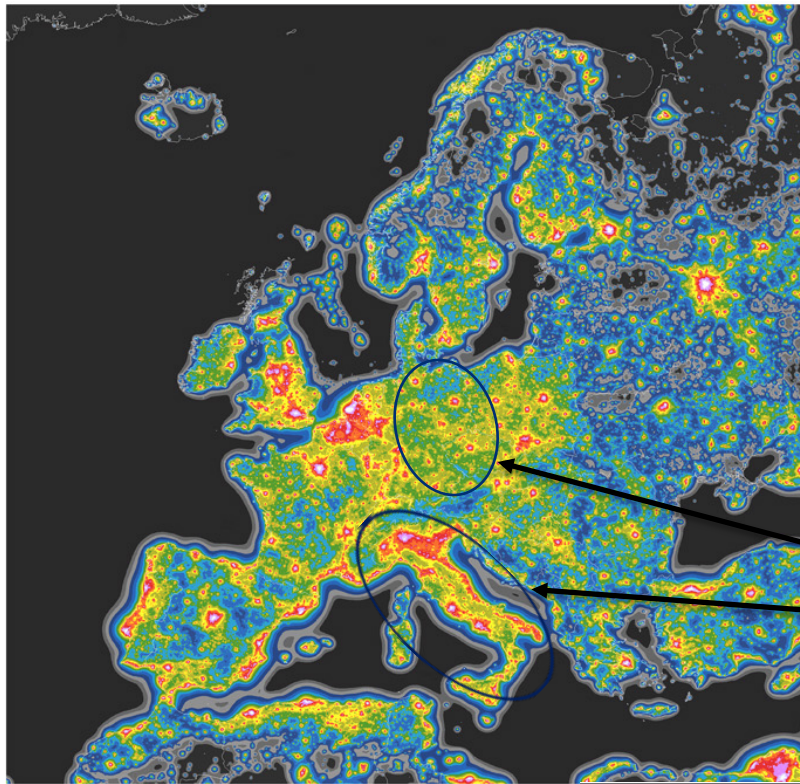**Dr. Arch. A. Radicchi, Technical University of Berlin**

CGI2017 | Rome June 7 2017

TYPES of LIGHT POLLUTION

Light reflected back due to heavy clouds

Upward reflected light

Direct upward light

Glare zone

Useful light

Light trespass

MY FREAKING EYEBALLS

Direct glare

Area to be lit

(Henckel, Radicchi CGI 2017)

Map of Europe's artificial sky brightness

Fabio Falchi et al. Sci Adv 2016
Published by AAAS

As shown there are several aspects of light pollution, one is artificial sky brightness.
The new world atlas of artificial night brightness gives the most recent overview on this indicator world wide. The brightness increases from black to white.
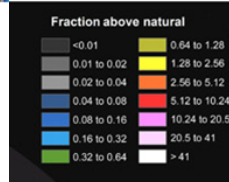
As visible Italy is much brighter than Germany.

Germany

Italy

NOISE POLLUTION: HOW LOUD IS TOO LOUD

FROM ROAD TRAFFIC

**NOISE AFFECTS APPROXIMATELY
125 MILLION EUROPEANS
(EEA, 2017)**

**ENVIRONMENTAL NOISE DIRECTIVE
49/2002
> 55 dB(A) L_{den}
> 50 dB(A) L_{night}**

FROM MOVIDA

?

EFFECTS

NOISE POLLUTION   &   LIGHT POLLUTION

SIGNAL DEGRADATION

DISRUPTION OF ECOSYSTEM
SERVICES, SKY VISIBILITY

HEALTH AND MENTAL PROBLEMS

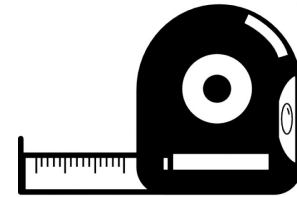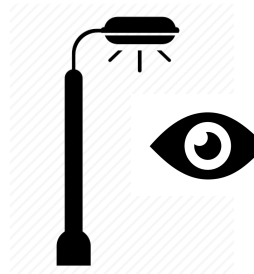SLEEP DISRUPTION,
HEALTH DAMAGES

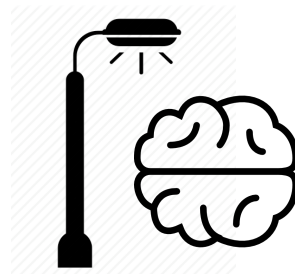$750 BILLION GLOBALLY (WHO 2011)

ENERGY COSTS,
ENVIRONMENTAL COSTS
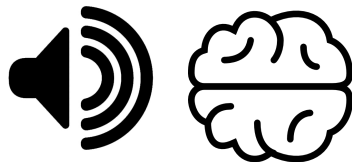
- Henckel, Radicchi CGI 2017 -

SIMILARITIES & OPEN QUESTIONS

BOTH SOUND AND LIGHT ARE EMITTED BY PHISICAL SOURCES AND CAN BE MEASURED

BOTH SOUND AND LIGHT ARE PERCEIVED BY THE BRAIN: EFFECTS CANNOT BE MEASURED

EU POLICIES / STATE OF THE ART

END 2002/49/EC ········► METHOD

DECIBELS /

70 dB(A)   70 dB(A)

Light is much less regulated than noise, lighting regulation is coming into awareness only recently (in some countries).

For street lighting there are only minimum requirements (ISO),
for the future maximum become necessary.

- Henckel, Radicchi CGI 2017 -

LIGHT- & SOUNDSCAPES OF THE URBAN NIGHT
BERLIN/FLORENCE

- Artificial Light & Noise pollution are matters of public concern

- Light and Sound Produce Similar Planning Challenges

- They demand mixed and integrated planning approaches

MAIN GOALS

- Integrated approach: light and sound, policies and empirics

- Development of new methods

- Definition of policy recommendations

- Henckel, Radicchi CGI 2017 -
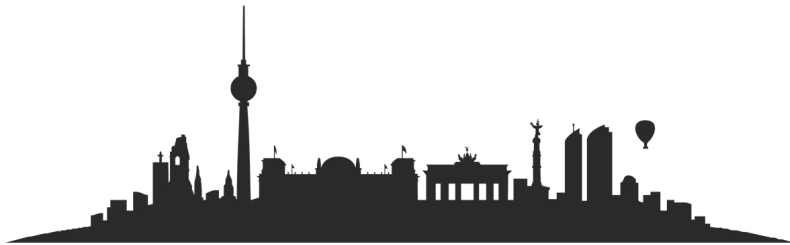
OLD VERSUS NEW LIGHTING TECHNOLOGIES

LIGHT- & SOUNDSCAPES OF THE URBAN NIGHT
BERLIN/FLORENCE

A COMPARATIVE CASE STUDY

ADDITIONAL METHODS APPLIED

Berlin/Kottbusser Tor

Florence/Santa Croce

literature review

surveys

expert interviews

sound and light walk

light measurement
(luxmeter)

sound measurement
(db-meter App)

sound recordings

videos

pictures

LIGHT- & SOUNDSCAPES OF THE URBAN NIGHT
BERLIN/FLORENCE

- Henckel, Radicchi CGI 2017 -

WHAT IS A SOUNDWALK?

"any excursion whose main purpose is listening to the environment" (H. Westerkamp, 1974)

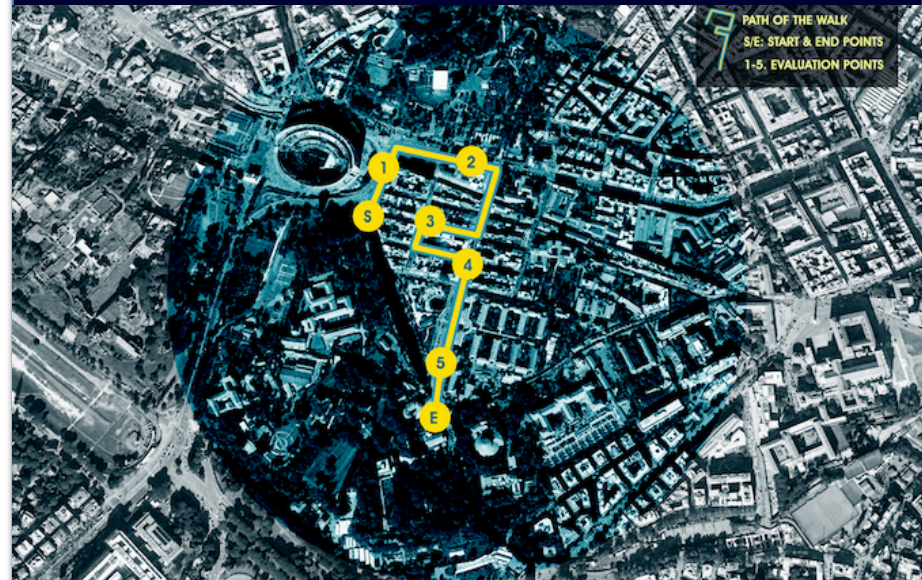| Purpose	Kind
Civic and political To increase sonic awareness of listening and the soundscape culture	Silent soundwalks
Educational To train for soundscape action research	Commented soundwalks with simple evaluation points
Research To evaluate the soundscapes in order to develop analyses, evaluation and planning criteria	Solo Soundwalks **Soundwalks with complex evaluation points**

[Table from Radicchi, A. (2017): A Pocket Guide to Soundwalking. Some introductory notes on its origin, established methods and four experimental variations. (in press)]

WHAT IT IS A SOUND- &LIGHTWALK?

"a combined sound- & light walk could be meant as any excursion whose main purpose is listening to the environment and looking at its artificially lit components" (Henckel, D., Radicchi, A. 2017)

Studio project > silent sound- & lightwalk

Conference > sound- & lightwalk with complex evaluation points

LIGHT- & SOUNDSCAPES OF THE URBAN NIGHT
BERLIN/FLORENCE

COMPARISON OF FINDINGS

Berlin   Florence   Berlin   Florence

DIFFERENCES

In Berlin the term „loud" is associated with traffic

Area generally perceived as loud TRAFFIC area

Loud noise from people play a bigger role

Area generally perceived as loud NIGHTLIFE area

Sound levels similar in both cities but...

...Berlin people rate the sound intensity higher

...Florentine people rate sound intensity lower

DIFFERENCES

In Berlin Illumination levels are significantly below DIN recommendations.

Even though Berlin is much darker in total...

Italy is the most light polluted country in the world (besides South Korea)

...and Florence is much brighter lit ...

.... the perception of people regarding light intensity is similar in both cities.

SIMILARITIES

Quiet places create positive feelings, associations with nature

Loud places create more negative feelings

general association with „loud" is traffic

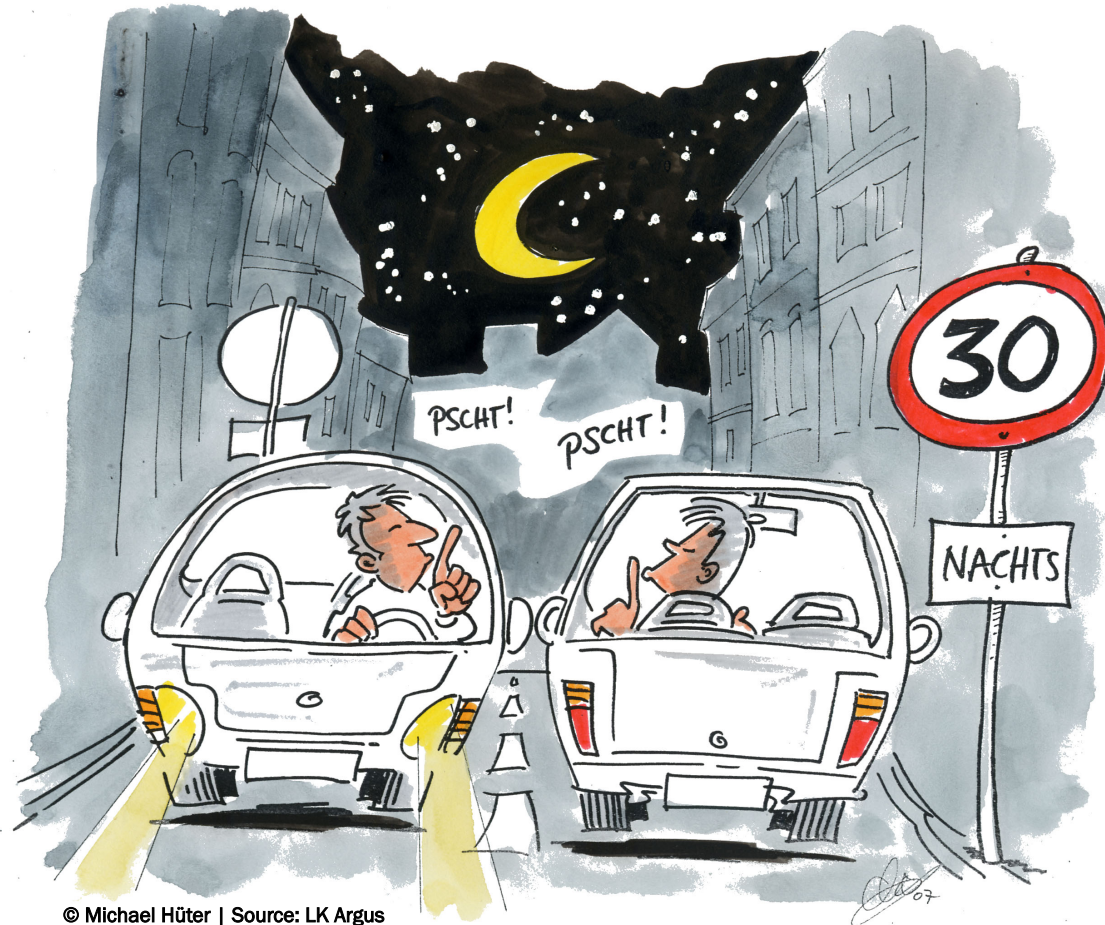**SIMILARITIES**

Dark places associate more negative feelings

Bright lit places create rather positive feelings, but it depends on the light source.

Light gives information about surrounding uses of buildings

(Extract from the students' final report)

- Henckel, Radicchi CGI 2017 -

CONCLUSION & FUTURE WORK

- **Light and sound (should) play an important role in urban planning**

- **Even in well advanced cities like Berlin and Florence the topics – let alone their integration - are heavily underrated**

- **The project was experimental and heuristic in its structure – but it produced valuable results and insights for**

  - The integration of both topics
  - For the improvement of methods (integration of qualitative and quantitative data)
  - For the development and improvement of the integrated sound- and lightwalk as a method for sensitizing the participants and to produce valuable data
  - The data should and could impact on urban planning
  - Recommendations for regulation on different scales
  - Triggered in international cooperation for projects

- **Contribution to the improvement of urban quality of life**

- **Future research agenda**

THANK YOU FOR LISTENING!

© Michael Hüter | Source: LK Argus

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