

Designers Lighting Forum

Your Course Title: **“UTILIZING LATENT PROPERTIES OF LIGHT FOR WELLNESS”**

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Date: March 19th 2025

Credit(s) earned on completion of this course will be reported to AIA CES for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

Learning Objectives

At the end of this course, participants will be able to:

1. Understand the Physiological and Psychological Impact of Light, Color, and Sound (LCS):

- Evaluate how different modalities—light, color, and sound—affect physiological and psychological responses, including circadian rhythms, mood, stress levels, and cognitive functions.

2. Identify Advanced Lighting Factors and Techniques:

- Explore and distinguish various advanced factors and techniques such as biomimicry and biophilic design, wireless controls, and integrative sound and color modalities to optimize wellness.

3. Design for Physical, Emotional and Cognitive Well-being:

- Understand how specific LCS combinations can be tailored to support vitality, emotional balance, mental clarity, and overall cognitive function in various environments.

4. Utilize Latent Potentialities of Modalities for Wellness Focused Innovation:

- Explore and harness the hidden potential of LCS modalities to drive research driven innovative design solutions that enhance user experience, improve environmental quality, and support holistic well-being in built environments.
- Develop strategies for combining lighting design with innovative principles and foster interdisciplinary collaboration among designers, engineers, researchers, and architects to create holistic solutions that promote health and wellness.



WHAT IS LIGHT?

Brief History of Light Levels



1950s AMERICA:

THE POPULAR ADAGE

“More light, better sight”

DOMINATED OUR APPROACH TO LIGHTING

LIGHT LEVELS: +1000 LUX



POST-1973 OPEC CRISIS:

Re-Examination of Required Light Levels to

Work More Efficiently With Less Light

LIGHT LEVELS: REDUCED TO 500 LUX



TODAY:

“Some judicious use of shadow would help
humanize our over-lit lives.”

Darkness: Basking in the Dimming of the Light

Murray Whyte, Toronto Star, Canada

LIGHT LEVELS: FURTHER REDUCED TO 300 LUX

- Lighting Design for Diversity & Special Needs



Over **40**
MILLION

American Adults Have Anxiety/Stress Disorders.¹ (Mar 2020)

Over **1.2**
BILLION

People Worldwide Suffer From Anxiety² (Mar 2020)

Nearly **1**
MILLION

People Commit Suicide Every Year. The Major Contributing Factor For Suicide Is Excessive Stress.² (Sept 2023)

Almost **75%**

Of People In Developing Countries, With Mental Disorders Remain Untreated.¹

¹ According To The Anxiety And Depression Association Of America

² According To The World Health Organization

- **Increased Productivity & ROI**
- **Employee Engagement & Global Economy**
- **Reduced Absenteeism**
- **Reduced Attrition & Turnover**
- **Enhanced Company Culture & Brand Value**
- **Improved Morale & Job Satisfaction**
- **Enhanced Health, Reduced Healthcare Costs**

“There is an increasing demand for comprehensive solutions for mental and physical well-being.”

- **Enhanced Productivity**
- **Improved Employee Retention**
- **Increased Engagement**
- **Vibrant Organizational Culture**
- **Increased Work-Life**
- **Reduced Healthcare Costs**



ROI

Return on Investment

VOI

Value on Investment

CONVENTIONAL UNDERSTANDING

- THE GENERIC APPROACH TO LIGHT FOR WELLNESS

3

Leading AI systems, such as **Google Gemini, Microsoft Copilot, Perplexity AI, Pi AI, and OpenAI GPT Playground**, highlight the widely accepted principles of light's role in wellness:

CIRCADIAN RHYTHM REGULATION

Light governs **biological cycles**, regulating sleep, hormone production, and overall health. **Warm light promotes relaxation, while cooler light enhances alertness.**

MENTAL HEALTH BENEFITS

Bright light therapy is recognized for alleviating conditions like **Seasonal Affective Disorder (SAD)** and improving emotional well-being.

HEALING AND RECOVERY

Red and **infrared light therapies** accelerate **cellular repair, reduce inflammation**, and aid physical recovery.

WELLNESS THROUGH LIGHTING DESIGN

Human-centric lighting (HCL) mimics **natural daylight patterns** to support **circadian rhythms**, enhancing **cognitive function** and emotional balance.

BROADER HEALTH IMPACTS

Light is used in **therapeutic settings** to aid **healing, reduce stress**, and improve overall quality of life.

UNLOCKING DEEPER DIMENSIONS

- THE HIDDEN POTENTIAL OF LIGHT FOR WELLNESS

BEYOND THE SCIENCE – THE ART OF EXPERIENCE

Light is not just a stimulus but an experience that shapes **emotion, memory, and behavior**. We design environments that **heal, inspire, and connect** by integrating **biophilic design, cultural narratives, and neuroscience**.

MULTI-SENSORY INTEGRATION: LIGHT, COLOR, SOUND (LCS)

Through the proprietary **LCS methodology**, we craft immersive ecosystems that **balance emotional states, enhance cognitive clarity, and restore well-being**.

CONTEXTUALIZING LIGHT

Each design is tailored to the **cultural and environmental context**, aligning with the emotional and physiological needs of the community. The functions of space are married with the **potentiality of modality** in each context.

HARNESSING THE LATENT FREQUENCIES OF LIGHT

Light's hidden properties are leveraged to **promote neuroplasticity, reduce stress responses, and align with natural rhythms**.

A NEW PARADIGM IN WELLNESS LIGHTING

Light is treated as an **active agent for transformation**, not just a functional necessity, delivering environments where **wellness is an intrinsic outcome**.

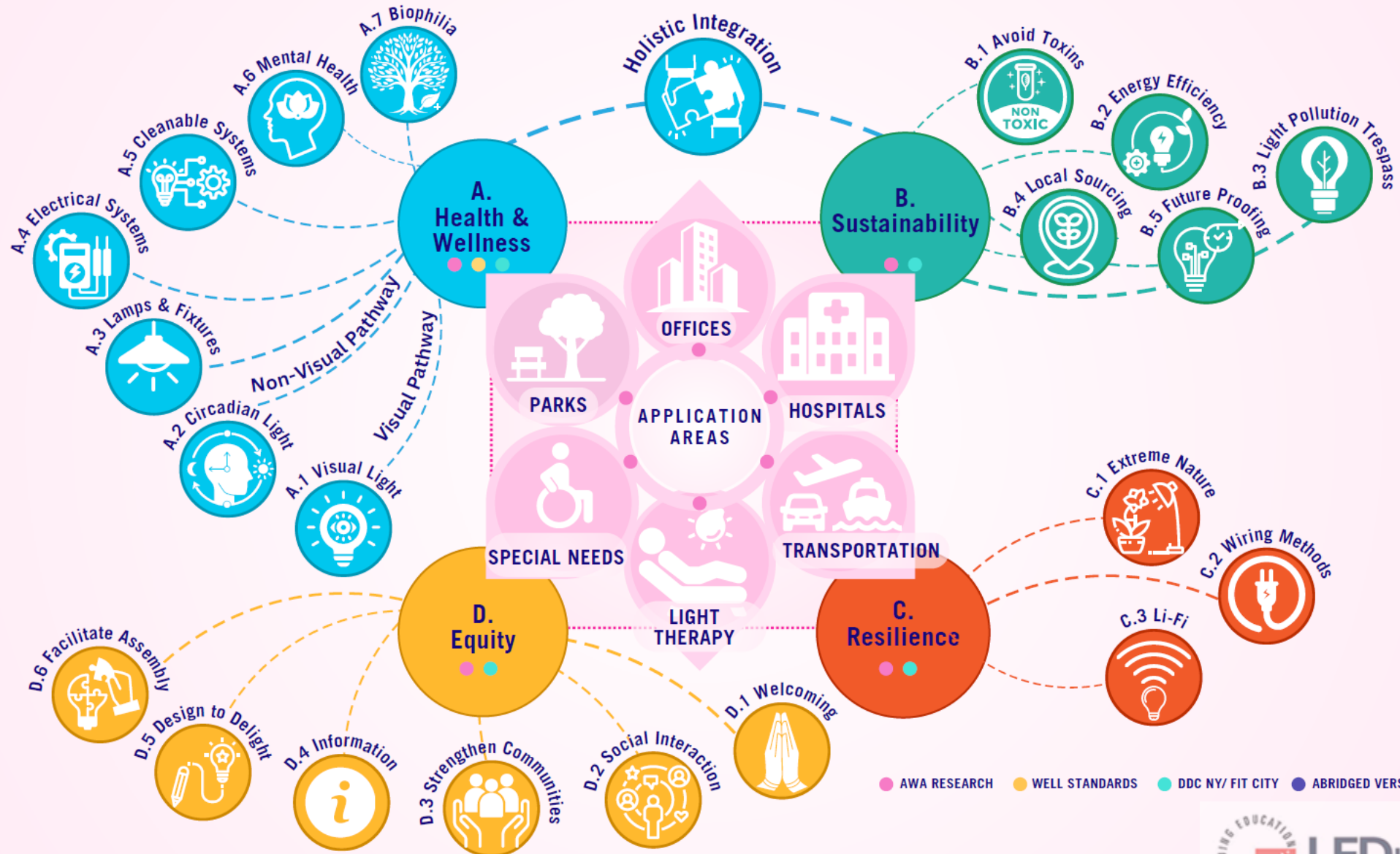
HUMANIZING LIGHT

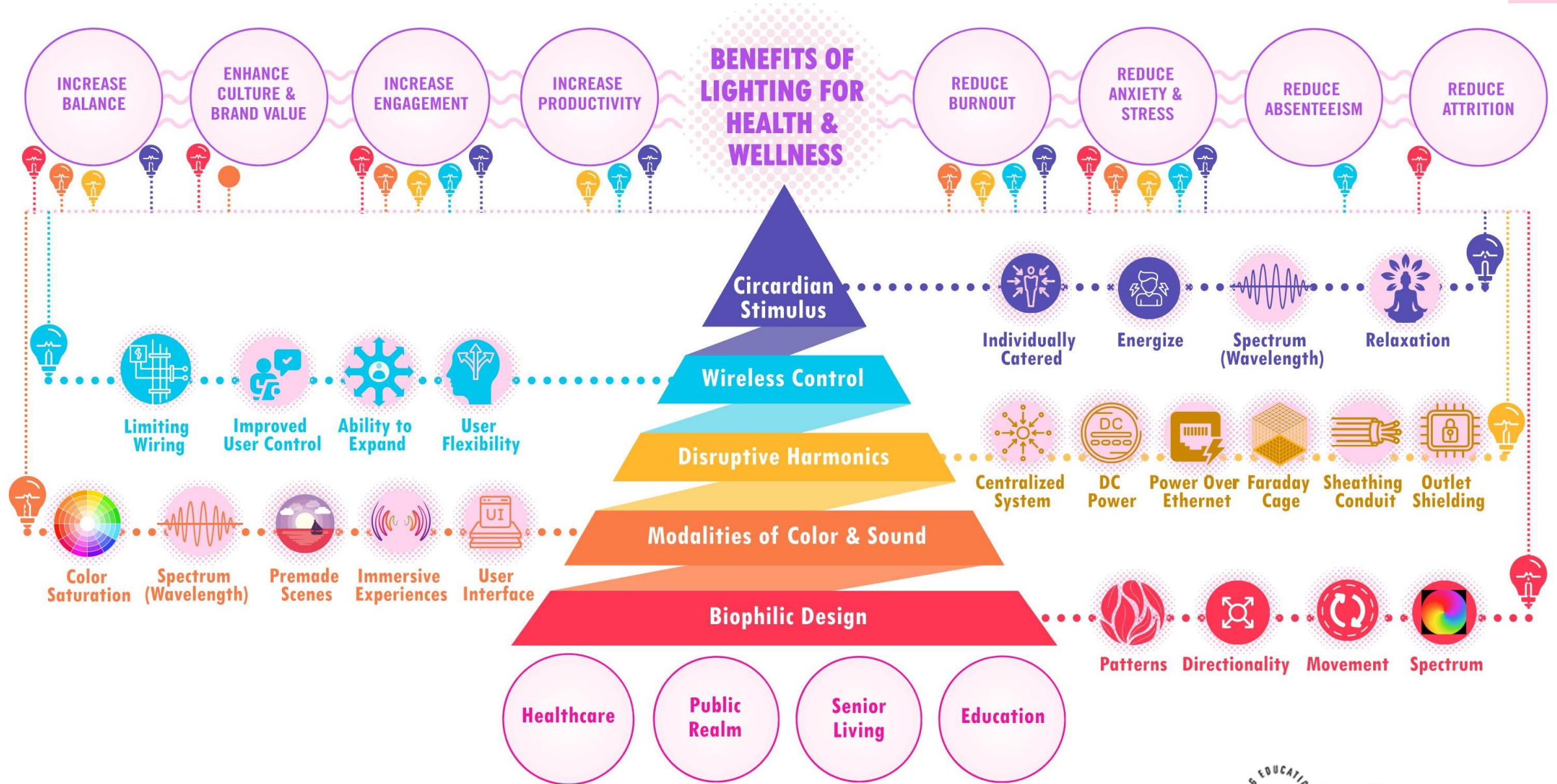
Viewing light as a **fundamental human need**, it is designed with **empathy and precision** to enhance the human condition. By understanding how light shapes **mood, perception, and well-being**, every solution is crafted to **nurture and empower** those who experience it.



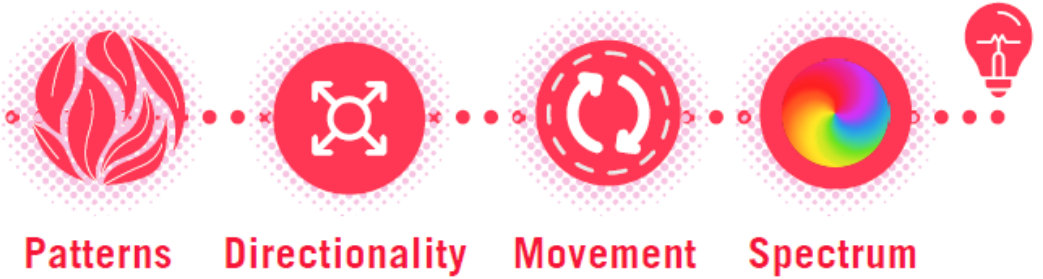
THE VALUE OF HEALTHY LIGHTING

How Lighting Impacts Health and Performance Across Diverse Sectors





Biophilic Design



WHY IS THIS RELEVANT?

- Disconnecting from nature negatively impacts health
- Increase in indoor time leads to illness and stress
- Appropriate lighting helps in reconnecting with nature



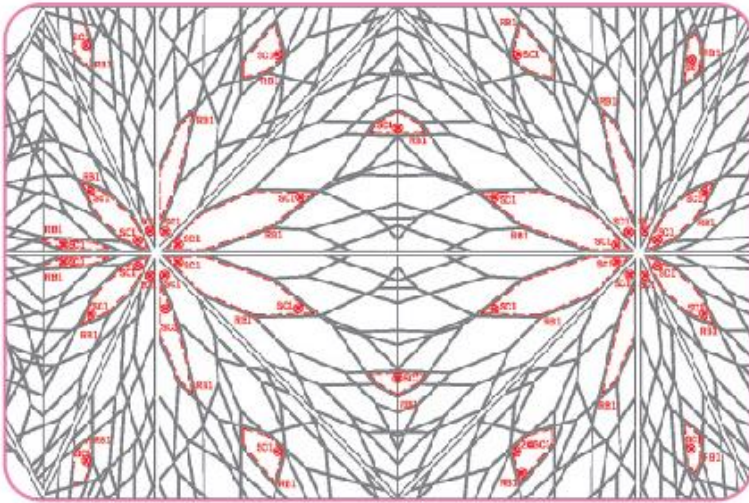
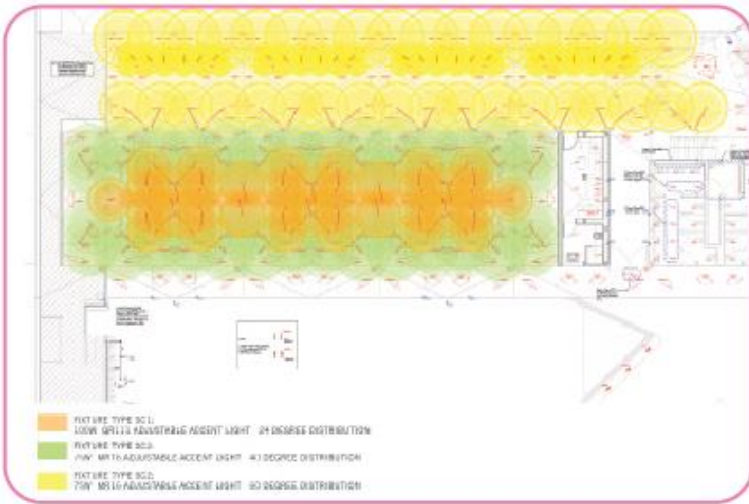
HOW DO WE IMPLEMENT THIS ON OUR PROJECTS?

- Integrate lighting to provide a visual connection to nature
- Design bespoke light fixtures that mimic nature

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BIOPHILIC DESIGN

- PATTERNS



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TOTE

BIOPHILIC DESIGN

- PATTERNS

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Different Locations



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BIOPHILIC DESIGN

- DIRECTIONALITY



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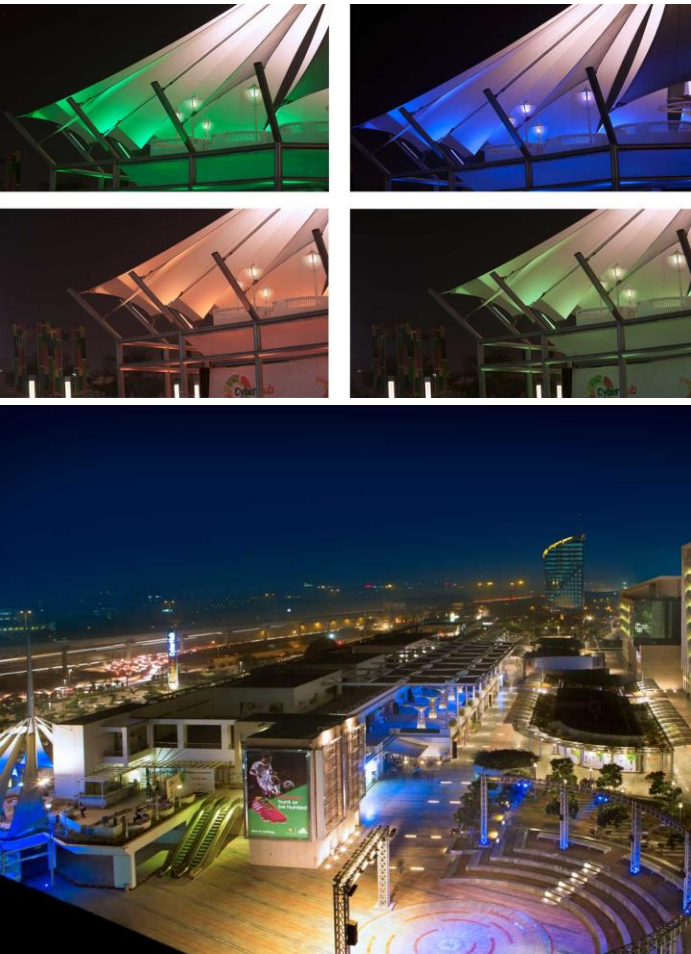
Peak Tower



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BIOPHILIC DESIGN

- MOVEMENT



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BIOPHILIC DESIGN

- MOVEMENT

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BIOPHILIC DESIGN

- SPECTRUM



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BIOPHILIC DESIGN

- SPECTRUM

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HOW DO WE BENEFIT? .

MODALITIES OF COLOR & SOUND



WHY IS THIS RELEVANT?

- Colors trigger and release neurochemicals
- Non-invasive and no medication needed
- An effective method to combat stress & anxiety
- Used to create balance and restoring good health

HOW DO WE IMPLEMENT THIS ON OUR PROJECTS?

- Provide automated lighting controls
- Set scenes for colors based on stress reducing programs
- Provide simple user lighting controls
- Provide RGBW LED color light fixtures



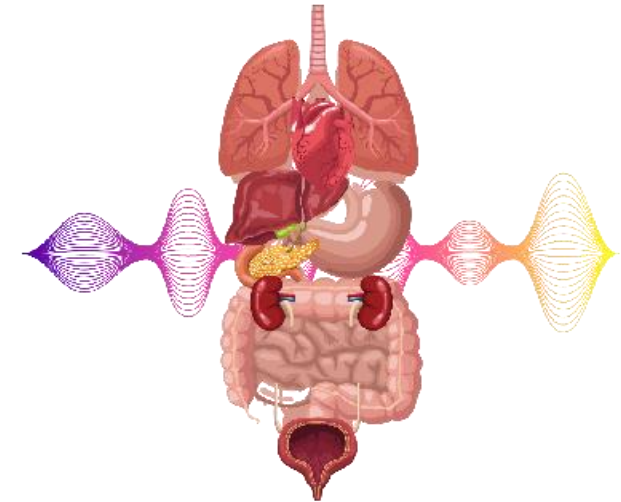
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Frequencies of Human Organs

ORGAN	FREQUENCY (HZ):
BLOOD	321.9
ADRENALS	492.8
KIDNEY	319.88
LIVER	317.83
BLADDER	352
INTESTINES	281
LUNGS	220
COLON	176
GALL BLADDER	164.3
PANCREAS	117.3
STOMACH	110
BRAIN	315.8
FAT CELLS	295.8
MUSCLES	324



Nogier Frequencies

- “Sickness results when cells, molecules or particles of matter are out of their normal resonance or vibratory pattern. By repeatedly exposing damaged tissue to the normal resonance frequencies associated with that tissue, healing often occurs, sometimes quite rapidly.”

DR. PAUL NOGIER, FRENCH NEUROLOGIST

Frequency 40 Hz

Parkinson’s disease (PD), and Alzheimer’s disease (AD)

Frequency 294 Hz

For tissue of ectodermal origin, such as body openings, skin and nerve. Field applications include wounds, eye injuries and after surgery.

Dr. Nogier discovered that all organs of the body are in resonance with a specific frequency.



Frequency 587 Hz

Neuropathy

Frequency 1174 Hz

Mesodermal tissue

Frequency 4698 Hz

Pain control

Light Therapy: Bright Light

- Most often used to treat patients with seasonal affective disorder
- Uses light box (10,000 lux capacity)
- The patient's eyes are to be at a prescribed distance from the light source with the light striking the retina
- Sessions commonly last from 10 to 15 minutes



Light Therapy: Cold Light

- Low intensity lasers are focused on a certain part of the body
- Light penetration into tissues
- Reduces swelling, heals wounds, pain reduces scars and wrinkles
- Encourages hair growth



Light Therapy: Laser

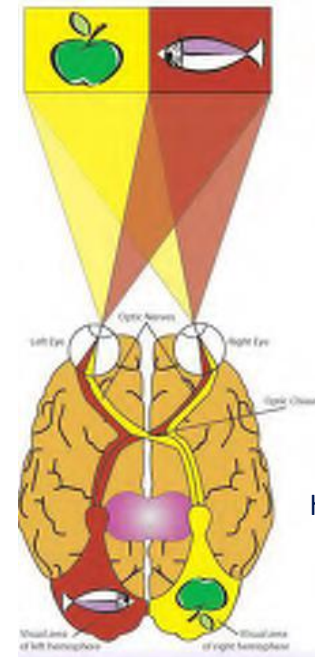
- Laser needle acupuncture
- From Schikora, Klowersa, Suwanda:
“The Laser Needle Therapy Handbook”
2012, p125, Publisher Laneg GMBH Wehrden ,
Germany, ISBN 9783-00-038967-2



<https://in.pinterest.com/pin/521291725596223064/>

Light Therapy: ABS & Brain Laterality

- Each side of the visual field is connected to one brain hemisphere (Optic nerve fibers crossover at the optic chiasma)
- Light can differentially influence brain Hemisphere dominance, and functions Specific to each hemisphere
- Lateral light developed in 1990s by Dr. A.P. Chuprikov (Russia)



http://www.yorku.ca/rsheese2/1010b/blog/?page_id=619

Light Therapy: Monochromatic Light

- Monochromatic light with bandwidth $< 10\text{nm}$ has Maximal biological impact (Tiina Karu)
- Karl Ryberg (Sweden) develops therapeutic instruments Based on monochromatic light which he calls “Super light”



<http://www.ramboll.com/media/ruk/experts%20to%20lead%20seminar%20on%20importance%20of%20lighting%20for%20wellbeing>
<http://giftofcoherence.com/dr-meher-engineer/>

Light Therapy: Strobing Light

- The Lucia N°03 gently entrains the brain, stimulates the pineal gland and opens up a beautiful space for visionary exploration
- The Lucia N°03 activates this light system and it spreads through the body, moving energy along the nadis, clearing blocks and lighting up the whole system.



<http://www.lucialightexperience.com/>

MODALITIES OF LIGHT, COLOR & SOUND

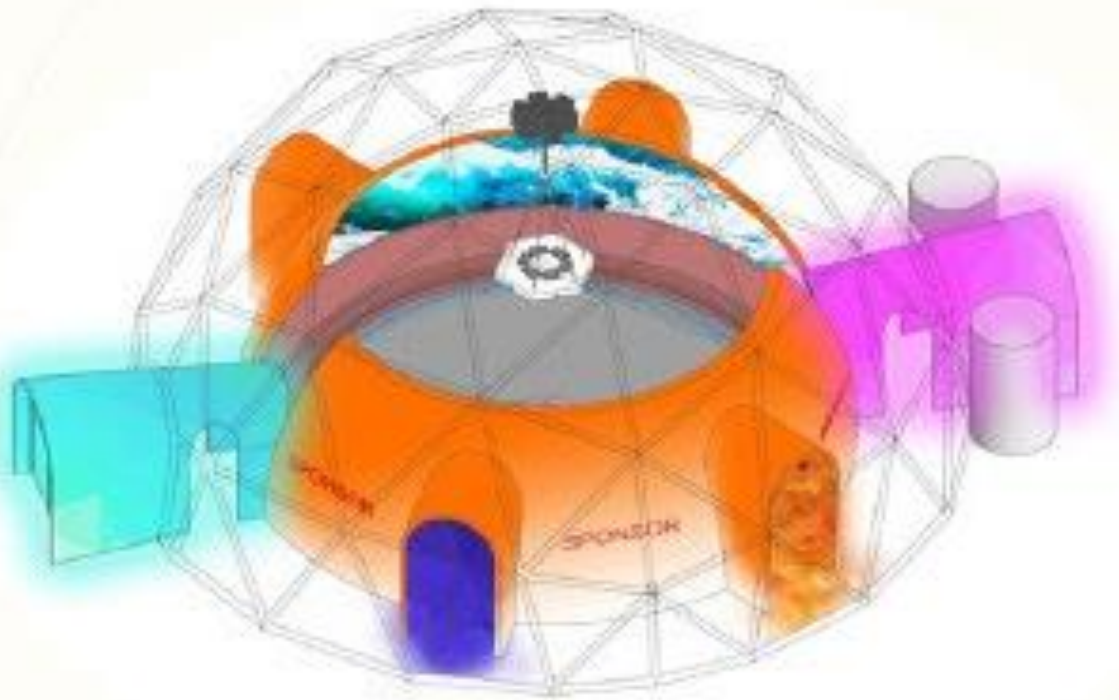
- IMMERSIVE EXPERIENCES

Children's Hospital of New Orleans

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SOULARIUM: Prototype Installation
PULA CROATIA 2019

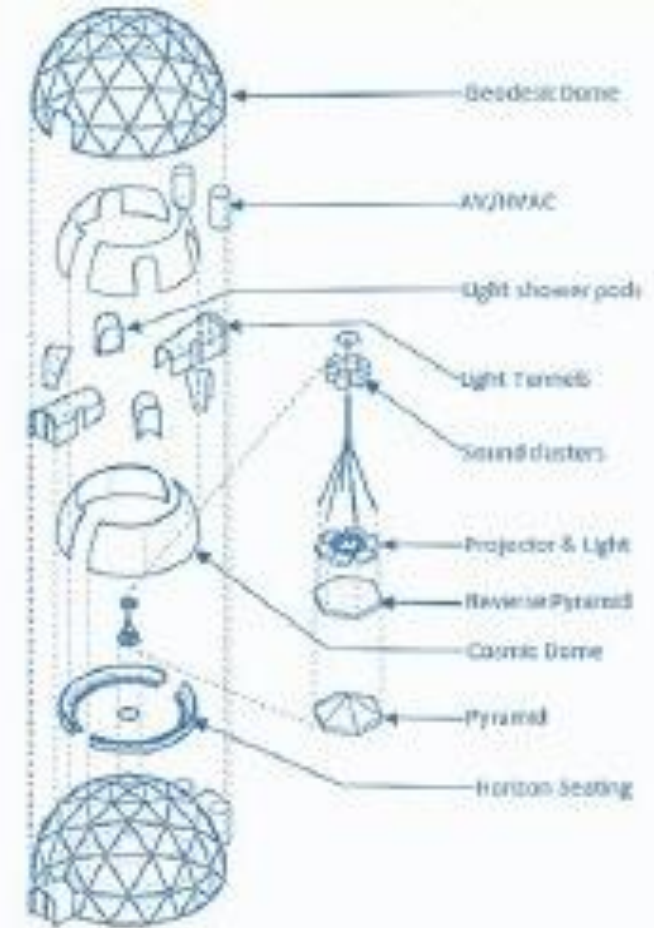


Fig. L.1

Exploded Axonometric View of SOUL-X

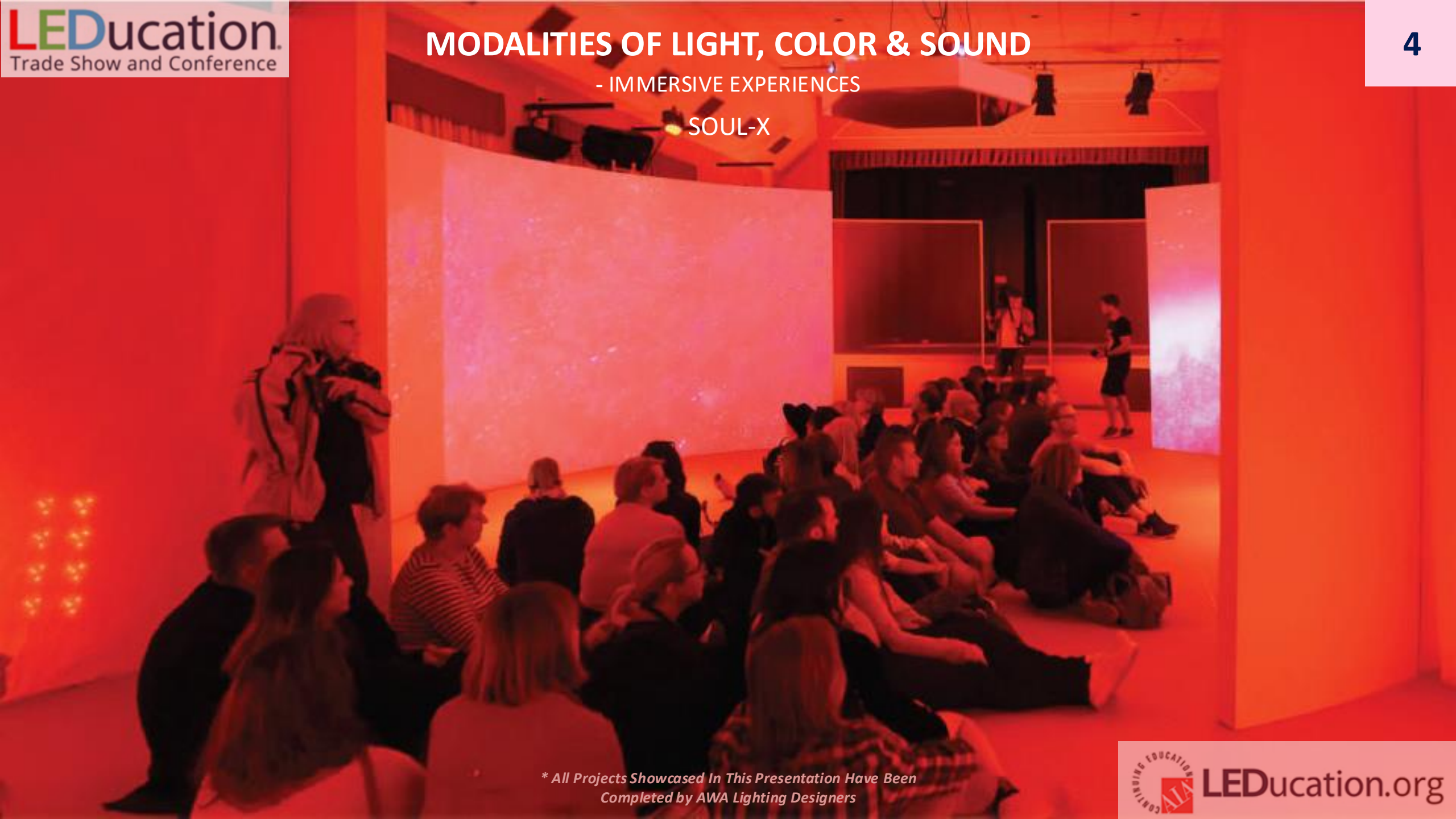
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MODALITIES OF LIGHT, COLOR & SOUND

- IMMERSIVE EXPERIENCES

SOUL-X

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MODALITIES OF LIGHT, COLOR & SOUND

- IMMERSIVE EXPERIENCES

SOUL-X

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Pula Croatia 2019

New York NY 2019

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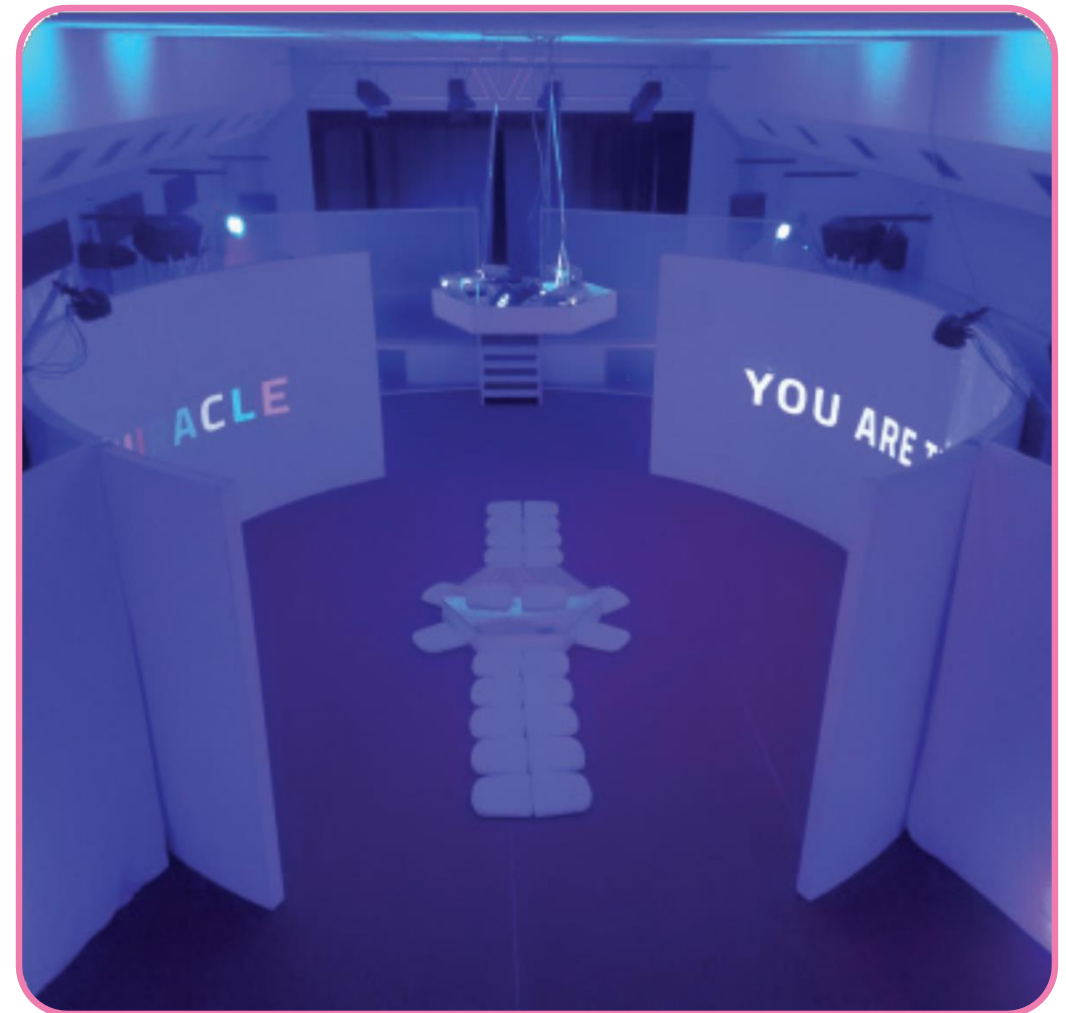


MODALITIES OF LIGHT, COLOR & SOUND

- IMMERSIVE EXPERIENCES

SOUL-X

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POP QUIZ!

IF YOU WOKE UP IN A SWITZERLAND PRISON CELL,
WHAT COLOR WOULD THE WALLS OF THE CELL BE?

A - White

C - Egg Shell

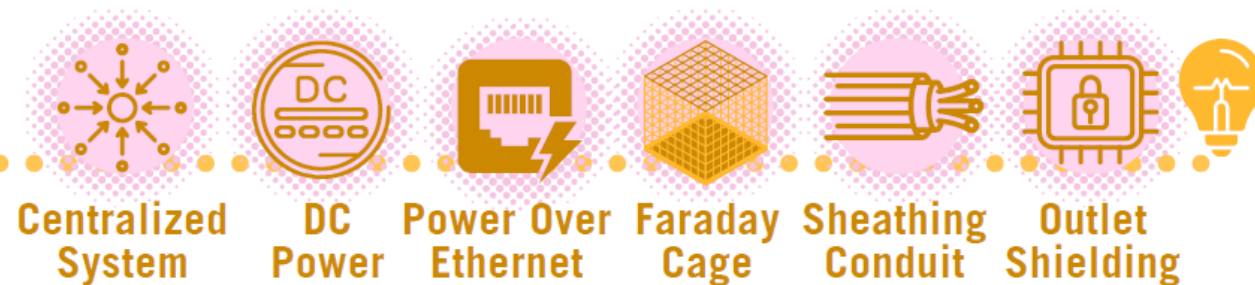
B - Pink

D - Blue

HOW DO WE BENEFIT?

- DISRUPTIVE HARMONICS

Disruptive Harmonics

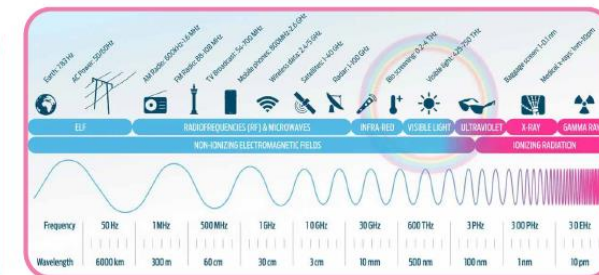
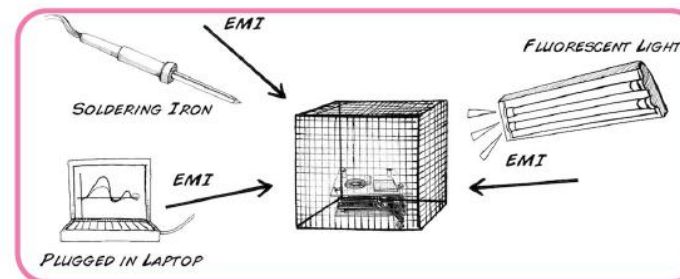


WHY IS THIS RELEVANT?

- Cognitive abilities are compromised
- EMF often interfere w/ human bodies
- Skin absorbs such harmful energies
- All electronic devices (AC to DC conversion) emit substantial EMF
- EMF & RFI Causes flickering of lights, which
- causes headaches & anxiety

HOW DO WE IMPLEMENT THIS ON OUR PROJECTS?

- Use one of the possible technology approaches
 - ❖ Low Voltage lighting system
 - ❖ Power Over Ethernet (POE) lighting system
 - ❖ DC-powered lighting systems



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What effect does artificial light have on student learning?

Uwe Geier, Forschungsring e.V.

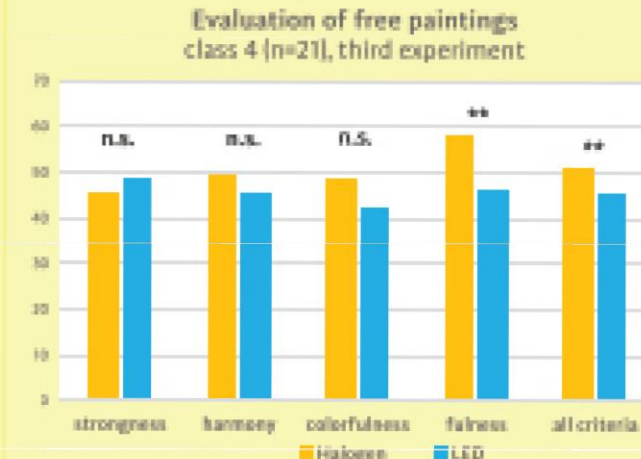
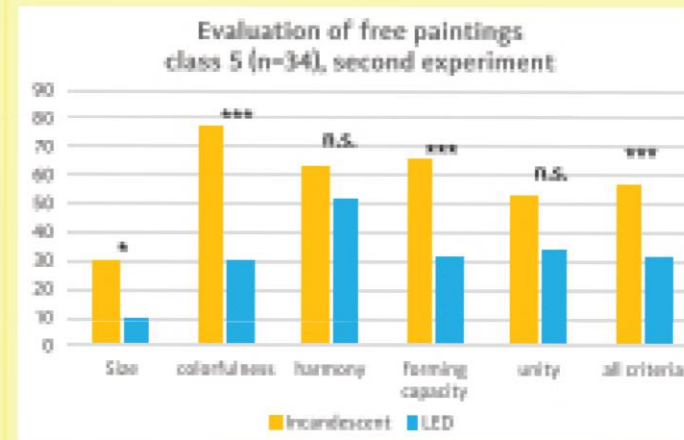
Results

In most of the cases, students performed better under halogen / incandescent lighting compared to LED lighting. In addition to painting capacity (see graphs), differences occurred in both dictation and memory tests.

In the first experiment, mistakes in orthography (four cases) under LED lighting were between 116% and 313% compared to halogen lighting (100%). In open retelling and text copying, more mistakes occurred in the use of correct verbs and tenses under LED lighting.

In the second experiment, the students from class 7 performed better under incandescent lighting concerning text length of open retelling (LED: 59%), mistakes in dictation (LED: 213%) and mistakes in mental calculation (LED: 109%). In class 5, the mistakes under LED were 172% (copy text) and 114% (dictation) compared to incandescent lighting. In class 3, in two exercises pupils performed better under LED lighting (dictation 88% and mental calculation 86%). In text copying, more mistakes occurred under LED lighting (140%). Class 3 painted free pictures twice. In both cases, pictures under incandescent lighting were evaluated better, with significant differences in 3 of 5, resp. 5 of 5 criteria of painting capacity.

In the third experiment in class 4, visual recognition (description of a photo) improved under LED lighting (107%), while length of open retelling (94%) and drawing capacity were reduced (90%). In class 6, length of open retelling (80%) and of drawing capacity was reduced under LED lighting (95%) compared to halogen lighting (100%).

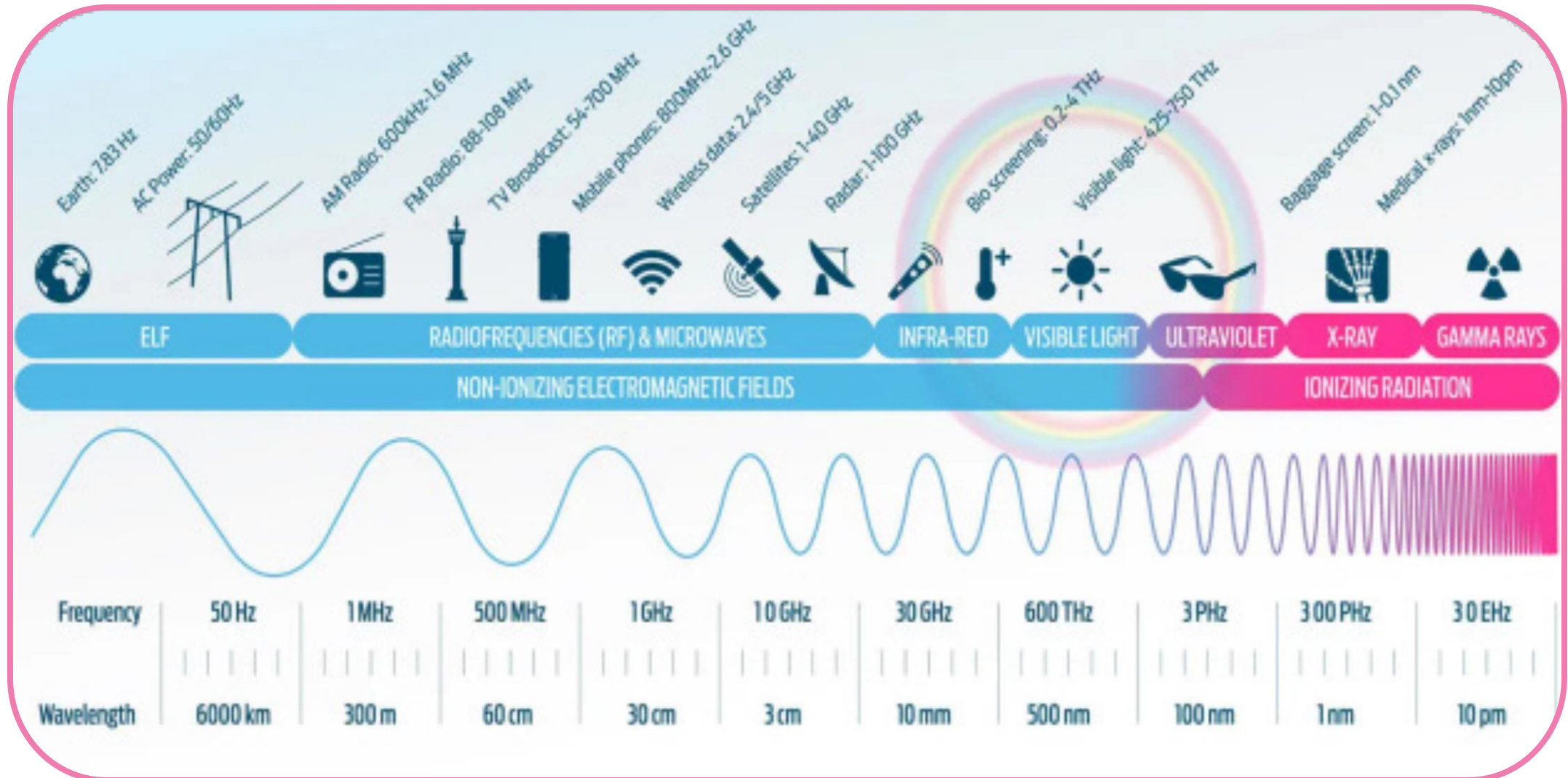


Analysis of Variance: n.s. = not significant
* = p < 0.05 ** = p < 0.01 *** = p < 0.001

DISRUPTIVE HARMONICS

- OUTLET SHIELDING

4



HOW DO WE BENEFIT?

- CIRCADIAN STIMULUS



WHY IS THIS RELEVANT?

- Circadian light can suppress melatonin at night
- Light at wrong time negatively impacts sleep
- Increased impact on the elderly
- Early morning cortisol for alertness

HOW DO WE IMPLEMENT THIS ON OUR PROJECTS?

- Delivering circadian stimulus efficiently to energize
 - users when required
 - Specify lights with health-enhancing blue wavelength
- of the light spectrum (when advisable)

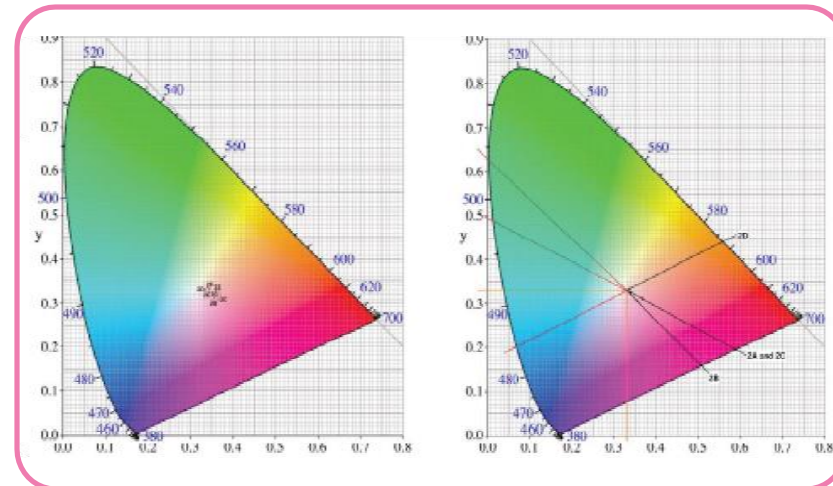
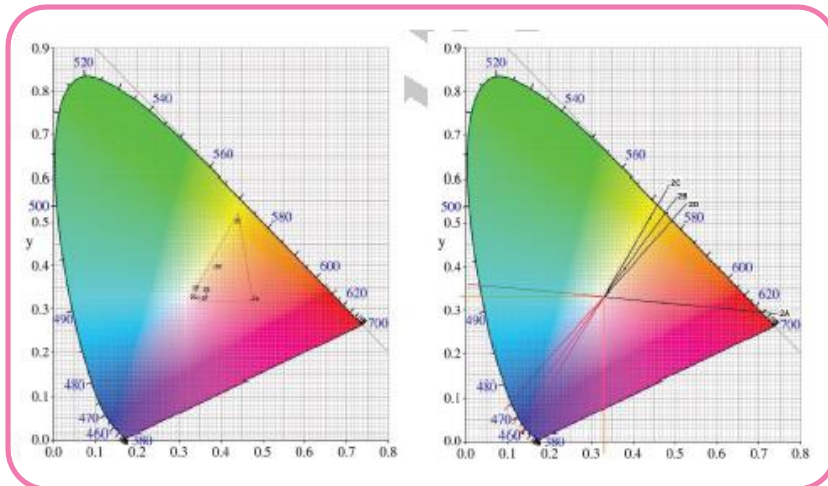
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BALI (8°S) SUNRISE



NEW YORK (40°N) SUNSET

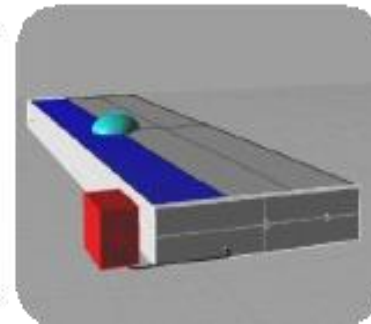
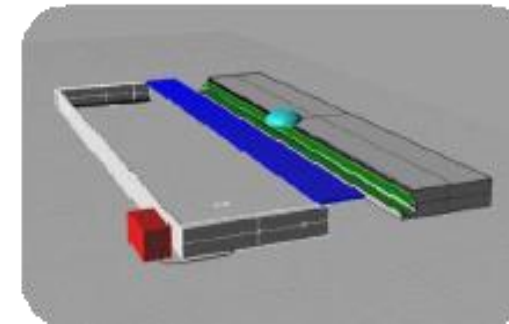
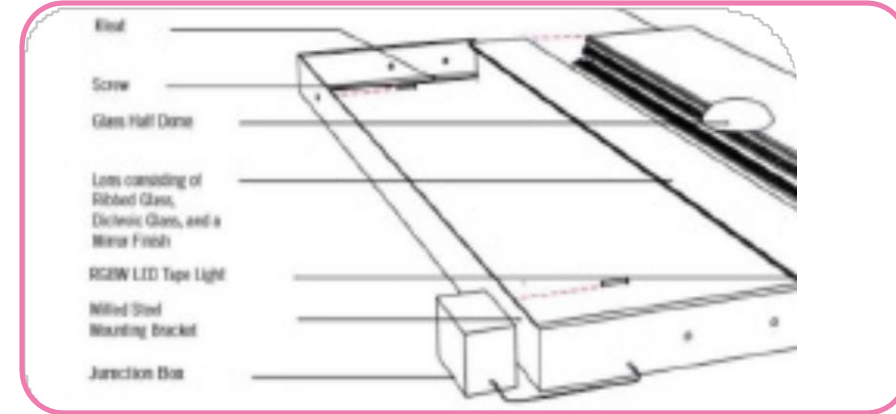
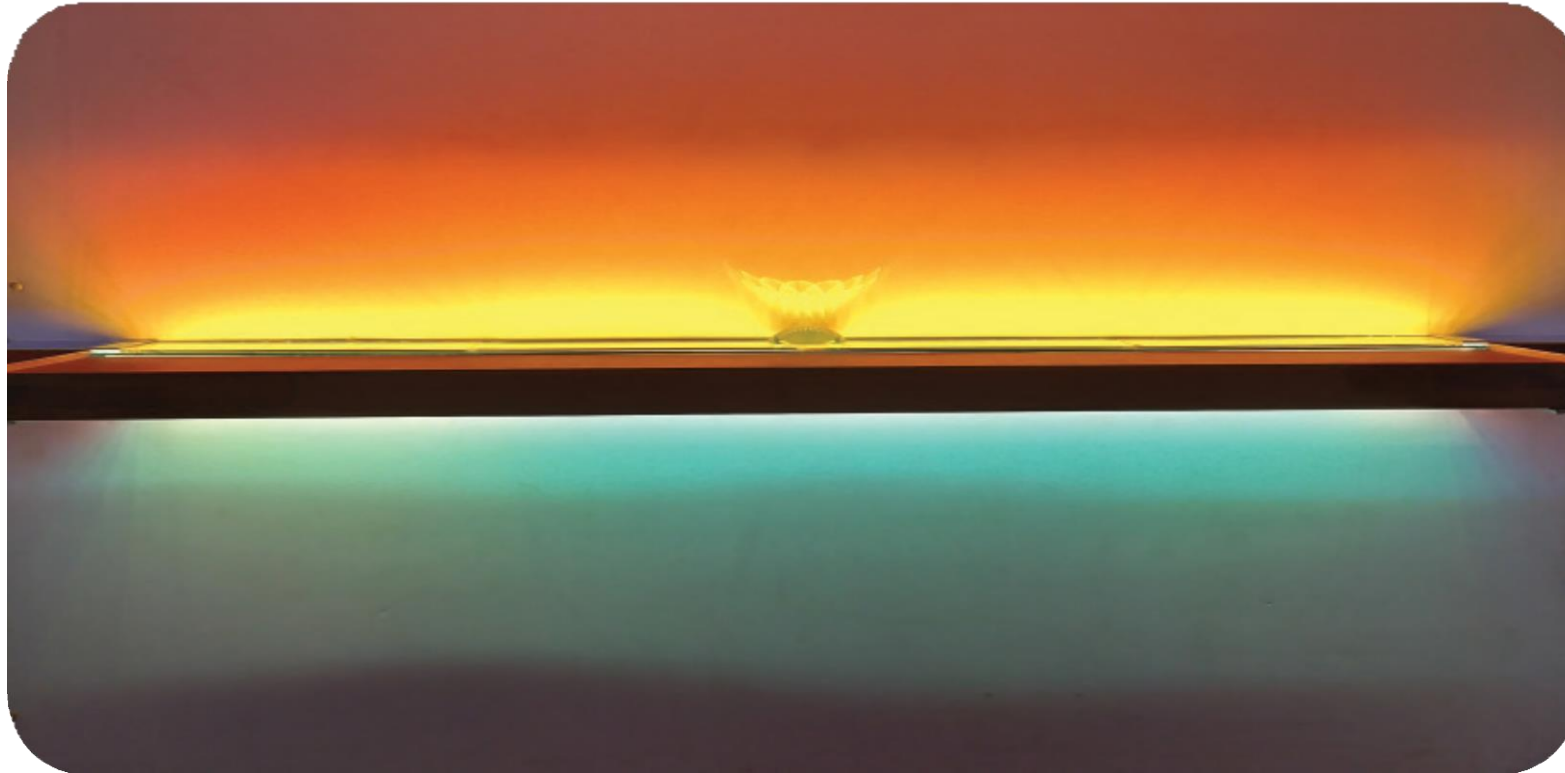


Horizon Light [AWA Patented Product]

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CIRCADIAN STIMULUS

- SPECTRUM



Horizon Light [AWA Patented Product]

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CIRCADIAN STIMULUS

- RELAXATION
Ludo Lounge

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This concludes The American Institute of Architects
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THANK YOU

NEW YORK (2002 to Present)

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Thank you for attending!

Please scan the QR code to rate it and leave feedback.



Sutton South

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