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UDC 77

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MODERN COLOR IN FINE ART PHOTOGRAPHY: BETWEEN SCIENCE, PERCEPTION, AND AESTHETIC EXPERIMENT

Summary. *The article explores the phenomenon of modern color in fine art photography as a synthesis of scientific characteristics (spectrum, temperature, CRI, color spaces) and the emotional–aesthetic impact on the viewer.*

Color is considered as a language of emotions and feelings, a means of communication between the author and the viewer that unites the physics of light, the psychology of perception, and artistic interpretation.

Using the author's series "Texture in Nature as Abstraction" and "Ocean" as examples, the study demonstrates how color moves from a technical domain into a philosophical one — becoming a tool of emotional and spiritual influence.

Introduction. Color in photography is one of the main means of artistic expression.

Isaac Newton proved that white light is a combination of all spectral colors (400–700 nm), while modern science clarifies that color cannot exist without both a light source and an observer.

It is the brain that interprets electromagnetic waves as the emotional sensation of color.

For a photographer, color is not only a technical characteristic but also a tool for conveying inner states, energy, and atmosphere.

Thanks to modern technologies (extended color spaces, high color rendering accuracy—CRI, and calibrated monitors), artists can create a complex emotional palette that influences the viewer on a subconscious level.

Purpose of the Study. The aim of this article is to analyze modern color in fine art photography as the interaction of three components:

1. **Physical and scientific** (spectrum, CRI, color temperature);
2. **Psychological** (perception, emotional code);
3. **Artistic and aesthetic** (author's interpretation of color in creative series).

Materials and Methods. The research combines scientific analysis with the author's artistic practice.

Methods of comparison, visual observation, color rendering analysis, composition, and experimental photography were used.

The shooting for the series *"Texture in Nature"* and *"Ocean"* was carried out during travels, mostly under natural daylight conditions.

The author works with both a professional camera and a mobile device, preserving the spontaneity of composition and the natural quality of light.

After shooting, each image undergoes digital post-processing in Adobe Photoshop, where the artist adjusts color, tone, and saturation, creating her own emotional and aesthetic interpretation.

The photographs are printed on **Hahnemühle Museum Grade** paper, which ensures high color accuracy, tonal depth, and archival durability of the prints.

Results and Discussion

4.1. Light and Spectrum

Light is the foundation of color.

Scientifically, Isaac Newton was one of the first to demonstrate that white light consists of multiple colors. He created a dark room in which a narrow beam of sunlight passed through a slit and was directed at a prism. As the beam passed through the prism, it refracted and dispersed into a sequence of colors — red, orange, yellow, green, blue, indigo, and violet.

This experiment revealed the phenomenon of light dispersion and proved that white color is not the absence of color but rather the combination of all wavelengths of the visible spectrum.

This discovery became the foundation of modern optics and color theory. White light, reflected from surfaces, shapes our visual perception of the world — all the hues we see are the result of the interaction between light and matter and of our visual system's response to different wavelengths.

Thus, color cannot exist without light, nor light without color, as they represent two sides of a single physical and perceptual phenomenon.

The range from **400 to 700 nanometers** forms the visible spectrum, where short wavelengths (violet and blue) are perceived as *cool*, while long wavelengths (red and yellow) are perceived as *warm*.

In photography, the interaction of these wavelengths creates spatial depth, mood, and the direction of emotional impact.

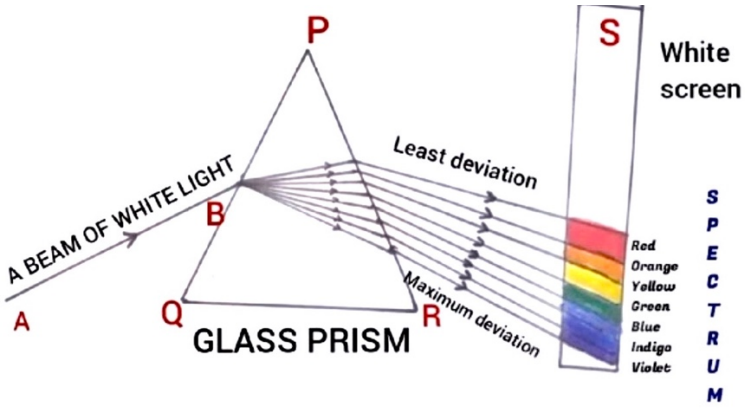


Fig. 1. Visible Color Spectrum, 400–700 nm.

Color Rendering Index (CRI) and Temperature

The **Color Rendering Index (CRI)** determines how accurately a light source reproduces the colors of objects compared to natural daylight (100 CRI).

Although most of the author's photographic series were created under natural light, understanding CRI remains important for maintaining color accuracy during printing and exhibition.

Color temperature is measured in Kelvins (K):

Table 1

Range of Color Temperatures (2700–9000 K)

Temperature (K)	Light Characteristic	Emotional Perception
2700–3200	Warm light	Nostalgia, calmness
5000–6500	Neutral daylight	Balance, harmony
7000–9000	Cool light	Distance, depth

The correlation between CRI and color temperature directly affects the viewer's emotional response.

The warmer the light, the more it evokes comfort and intimacy; the cooler the light, the more it suggests clarity, space, and detachment.

Understanding these parameters allows photographers to create emotional atmospheres through illumination and tone.

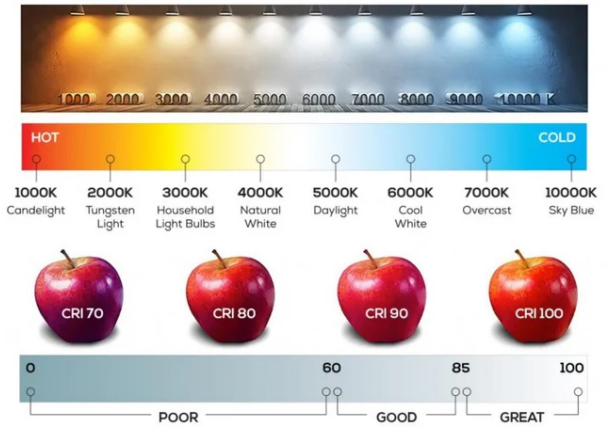


Fig. 2. Color Temperature and CRI Explained

Color as an Element of Abstraction

In the 21st century, artists such as **James Turrell**, **Uta Barth**, and **Wolfgang Tillmans** experiment with color as the material of light itself. They demonstrate that color can construct space even without an object.

In contemporary art, color is no longer merely descriptive — it becomes an autonomous field of energy, perception, and emotion.

According to recent studies in art theory (Metropolitan Museum of Art, 2023), for many artists of the 20th–21st centuries, color is no longer a symbol or representation of an object but an independent object of perception that can exist without figurative content.

This tendency is evident in contemporary abstract photography, where artists explore not the subject but the interaction of light, color, and texture.

Research in **neuroaesthetics** (What does the brain tell us about abstract art?, PMC, 2021) shows that viewing abstract color compositions activates the same brain regions as emotional responses to music — the limbic system, prefrontal cortex, and reward centers.

This suggests that abstract color art directly influences the emotional centers of the human brain, even without a narrative context.

In the author's series *"Texture in Nature as Abstraction"* and *"Ocean"*, color functions as a medium for constructing new space — where physical matter becomes the vibration of emotion.

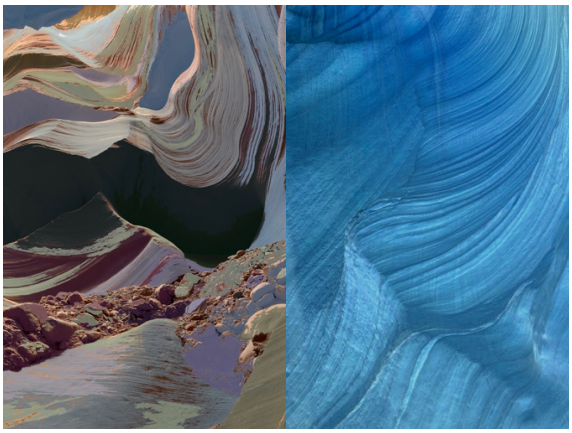


Fig. 3. Tetiana Hordiichuk, Texture in Nature as Abstraction, 2024

Fig. 4. Tetiana Hordiichuk, Ocean, 2024

Psychology of Color

Johann Wolfgang von Goethe regarded color as "the deeds and sufferings of light," while **Johannes Itten** saw it as "the reflection of the artist's inner state."

Modern research in **neuroaesthetics** (Zeki, 2014; Palmer & Schloss, 2010) confirms that abstract color activates the brain's emotional areas even without representational content.

In contemporary art photography, the approach has changed: color no longer describes the object but expresses emotional and spiritual experience.

Fine art photographers use color as a communicative tool — conveying intuition, mood, and the depth of feeling.

Table 2

Psychological Perception of Colors

Color	Psychological Effect	Emotional Association
Red	Stimulating	Energy, passion
Orange	Activating	Warmth, joy
Green	Harmonizing	Balance, nature
Blue	Calming	Depth, trust
Violet	Inspiring	Intuition, creativity

These associations are not fixed; rather, they depend on context, personal memory, and the viewer's subconscious perception.

The Subjectivity of Color

Color perception is always subjective — it depends on lighting conditions, context, physiology, and the emotional state of the observer.

When working with color, the artist constructs not only a visual image but also an "inner space" that defines mood and atmosphere.

As Goethe wrote, *"Colors are the deeds and sufferings of light."*

Through color, the artist transfers their internal rhythm to the visual field, creating emotional resonance between the artwork and the viewer.

Warm and cool hues, contrasts, and transitions shape how we perceive depth, proximity, and emotional intensity within an image.

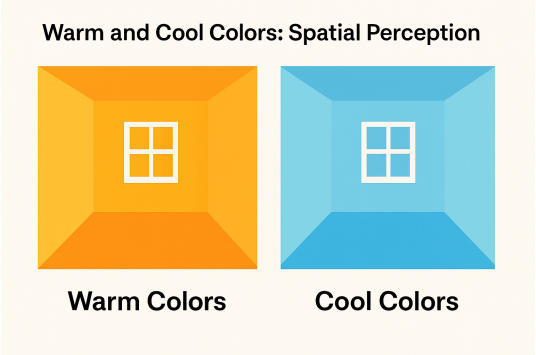


Fig. 5. Warm and Cool Colors in Spatial Perception

The Aesthetics of Contemporary Color in Photography

In contemporary photography, color ceases to be merely a means of realistic depiction — it becomes a field of experiment and a symbol of authorial individuality.

Fine art photographers consciously develop their own *language of color*, creating unique palettes that blend natural, synthetic, and digital tones.

This process gives rise to the concept of the **"author's color"** — a recognizable element of personal style, functioning as the artist's aesthetic signature.

This new aesthetics emerges at the intersection of science, technology, and sensory experience.

With advanced tools and extended color spaces (Adobe RGB, ProPhoto RGB, DCI-P3), photographers can manipulate color as precisely as musicians work with tone and rhythm.

The contemporary author no longer merely selects hues but constructs a color atmosphere — experimenting with temperature, saturation, contrast, and light to achieve emotional depth and spatial tension.

In fine art photography of the 21st century, color becomes an autonomous artistic medium — a means of meditation and contemplation, yet also an energetic force shaping interaction between the viewer and the artwork.

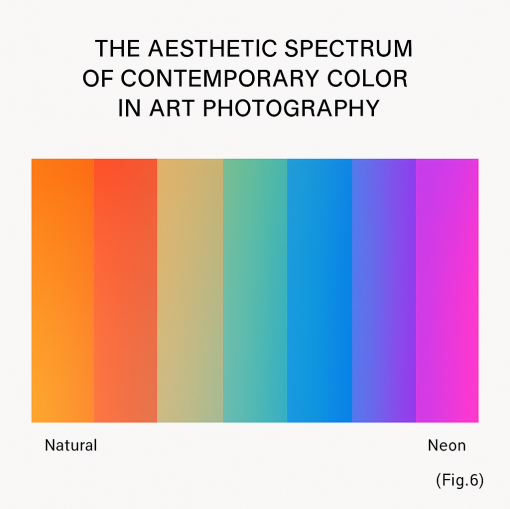


Fig. 6. The Aesthetic Spectrum of Contemporary Color in Art Photography

Conclusions

1. In fine art photography, color functions not only as a technical element but also as a means of emotional, spiritual, and intellectual self-expression.

2. The combination of natural light, artistic interpretation, and digital processing forms a unique aesthetic of modern color, where physical parameters (spectrum, temperature, saturation) merge with psychological perception.

3. Through modern technologies (Adobe RGB, DCI-P3, Photoshop), artists can precisely control color and convey personal emotional states and artistic philosophy.

4. Color in contemporary photography serves as a universal artistic language — integrating science, perception, technology, and inner experience.

5. In the work of the modern photographer, color becomes an aesthetic code — the pulse of their style, emotions, and worldview.

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