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A REFLECTION ON THE SOUNDS OF COLOR AND LIGHT

And

ROOM OF COLORS

By

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ABSTRACT OF THE DISSERTATION
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There have been many compositional attempts to correlate color with music since the end of 19th century. These idiosyncratic attempts ranged from simple artistic metaphor as a compositional process to a phenomenon of involuntary experiences known as synesthesia. Alexander Scriabin added “clavier à lumières” (keyboard with lights) to his orchestral piece *Prometheus: The Poem of Fire*, Op. 60 (1910) to present his vision of color-music correspondence. Olivier Messiaen applied his synesthetic ability through color chords based on his modes of limited transposition in *Couleurs de la cité céleste* (Colors of the Celestial City, 1963). Unsuk Chin, a Korean composer widely acclaimed in Europe, expressed the characters of light in *Rocaná* (Room of Light, 2008) by exploring the different sound effects of each instrumental group. Following an introduction to synesthesia, including the criteria for identifying the phenomenon and a discussion of synesthetic composers, these three works, and my composition “Room of Colors” for orchestra (2012), will be examined as illustrations of the inclusion of color and light in compositional processes.

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A REFLECTION ON THE SOUNDS **OF COLOR AND LIGHT**

YOON KYUNG PARK

INTRODUCTION

Project Background and Research Objectives

On March 8, 2008, I attended the U.S. premiere of Unsuk Chin's *Rocaná* at Carnegie Hall. The title *Rocaná*, from the Sanskrit, means "room of light;" that night, I experienced the composer's various expressions of light through all the instruments of the orchestra. In the fall of the same year, Rutgers student composers collaborated with students in the art department, resulting in the project concert "SONIC IMAGERY: Visual and Musical Artworks." All of the compositions on the program were new, written in response to visual artworks. As part of this project, I worked with Jian Chen, and composed a piece for viola, cello, and piano in response to his painting "Mnemosynic Feerie." My compositional approach was to "read" the painting as a narrative and relate musical events to specific events perceived in that narrative (see Figure 1 and Example 1).

Figure 1: *Mnemosynic Feerie* (2008), by Jian Chen



Example 1: *Mnemosynic Feerie* (2008) for viola, cello, and piano, opening***Mnemosynic Feerie (2008)***

for Viola, Cello, and Piano

Yoon K. Park

Adagio ($\text{♩} = \text{ca. } 60$)

Viola: [She enters in the urban stage filled with leafless trees.] [She is getting a part of the trees.]

Violoncello: *p espress.* *mf* *mp*

9 One tree gives his hands to her. *mf* *f*

16 *f* *mp*

Pno.: *p* *mp*

It is early evening..

A

Allegretto con moto ($\text{♩} = \text{ca. } 96$)

21 They start dancing together. *mf* *f*

A

Allegretto con moto ($\text{♩} = \text{ca. } 96$)

Pno.: *mp* *mf* *f*

In the process of this collaboration, participants also discussed and studied other music inspired by visual arts¹ in a meeting of the GCF (Graduate Composers Forum). Since then, I have been thinking more about the relationship between music and color; while doing research, I became familiar with the neurological condition synesthesia, which I learned several composers have experienced. Furthermore, some music by these synesthetes reflects that phenomenon; although there are other important elements in that music, the perception of color is essential. As Messiaen, a well-known synesthete, put it: “More than the form, more than the rhythms, and more than all the timbres, it is necessary to hear and to see sound-colors in my works.”²

Some music evokes a sense of color, intentionally or not, by simultaneously stimulating neural pathways related to the perception of color. For instance, I experience this whenever I hear Unsuk Chin’s music, especially in live performance. To explore this phenomenon as it appears in composed music, I will introduce the workings of synesthesia, then discuss how color and/or light is manifested in the compositional methods used to create selected pieces by Alexander Scriabin, Olivier Messiaen, and Unsuk Chin, as well as my own piece for orchestra, “Room of Colors.”

¹ See Appendix.

² “Plus que la forme, plus que les rythmes, et plus que tous ces timbres, il faut entendre et voir dans mon oeuvre, des son-couleurs.” Olivier Messiaen, et al., *Hommage à Olivier Messiaen: novembre-décembre 1978* (Paris: La Recherche artistique, 1979), 64.

CHAPTER 1: COLOR AND MUSIC

1.1. Synesthesia

A standard definition of color is “the property possessed by an object of producing different sensations on the eye as a result of the way it reflects or emits light: *the lights flickered and changed color*” (from the Oxford Dictionary).³ With color goes light, “the brightness that comes from the sun, fire, etc. and from electrical devices, and that allows things to be seen” (from the Cambridge Advanced Learner's Dictionary & Thesaurus © Cambridge University Press). Color and light are inseparable, because light creates color.

Synesthesia, a word from the ancient Greek *syn* (together) and *aisthēsis* (sensation), is “a neurological condition in which stimulation of one sensory or cognitive pathway leads to automatic, involuntary experiences in a second sensory or cognitive pathway.”⁴ Most people have five distinct senses (hearing, sight, touch, smell, and taste), but synesthetes experience two or more sensory modalities simultaneously. Color is a particularly common component of synesthetic experience; the most common type of synesthesia is called grapheme-color synesthesia, in which letters or numbers are perceived as inherently colored. György Ligeti had grapheme-color synesthesia. A less

³ Within this paper, ‘color’ refers to its literal sense. When referring to instrumental ‘color’, which is metaphorical, I will use ‘timbre’.

⁴ Richard E. Cytowic, *Synesthesia: A Union of the Senses* (2nd edition) (Cambridge: MIT Press, 2002). Entry derived from <http://en.wikipedia.org/wiki/Synesthesia>

common form is color-music synesthesia,⁵ such as Olivier Messiaen had. There are about 60 different types of synesthesia reported; about 3.7% of the general public have some form of synesthesia.⁶

According to the neurologist Richard E. Cytowic, synesthesia is not imagination or a learned response, and differs from metaphor and deliberate contrivances such as “colored music.”⁷ For example, Scriabin uses color in *Prometheus* as a type of sensory metaphor, a deliberate contrivance to evoke a particular aesthetic experience. The physiological phenomenon, sometimes called “idiopathic synesthesia,” is usually recognized as ‘true’ synesthesia distinct from acquired, such as that brought about through drugs, brain lesions, electrical stimulation of the brain, and other ‘acquired’ conditions or states.

Cytowic presents five parameters as diagnostic criteria to ascertain an idiopathic or true synesthetic experience, and to distinguish the idiopathic synesthesia from acquired synesthesia.⁸ First, *synesthesia is involuntary, but elicited*. It cannot be suppressed, and, vice versa, cannot be evoked at will. Second, *synesthesia is spatially extended*. For example, color-music synesthesia is projected, within immediate grasp of the body; the color is neither retinally derived nor is it mentally imagined, the only two ways in which non-synesthetes can experience color sense from sound. Third, *synesthetic percepts are consistent and discrete*. The associations between color and music are always the same,

⁵ A survey by Sean Day, the president of the American Synesthesia Association and himself a synesthete, found that only 19.23% of synesthetes experience color-music synesthesia (compared to 62.51% experiencing color-grapheme synesthesia).

⁶ <http://www.daysyn.com/Types-of-Syn.html>, accessed on March 6, 2013.

⁷ <http://www.cytowic.net/?p=244>, accessed on March 6, 2013.

⁸ Cytowic, *Synesthesia: A Union of the Senses*, 67-70.

over a lifetime. If a certain sound is red for a synesthete, it is red all the time; the context of the stimulus does not affect it. Fourth, *synesthesia is memorable*. Many synesthetes use their sensory experience as mnemonic aids, since synesthetic percepts are often more easily remembered than the original stimulus. Fifth, *synesthesia is emotional*. Synesthetes trust their perceptions and have a conviction that what they perceive is real.

“Colored hearing”--sound-color synesthesia or chromesthesia--can emerge from everyday environmental sounds such as dogs barking, dishes clattering, voices, and especially music. The experience is likened to fireworks: colored shapes arise, move around a bit, and then fade when the sound ends.⁹ For synesthetes, that is not vivid imagination, but their perceptual reality. For example, when listening to Beethoven’s Symphony No. 6, non-synesthetes might conjure up a pastoral landscape through conscious or semi-conscious imaginative effort; synesthetes, however, will visually perceive colorful moving geometric shapes or lines with height, width, and depth.¹⁰ Most people will describe a major key as ‘brighter’ than a minor key, or consider low tones ‘darker’ than high tones; the word “sea” might lead them to conjure up the color blue. However, for synesthetes, the “blue” is not just “blue.” Indeed, “blue” is described by synesthetes much more precisely, since synesthetic experience is specific. Messiaen, for example, defined the first transposition of Mode 2 as “blue-violet rocks, speckled with little gray cubes, cobalt blue, deep Prussian blue, highlighted by a bit of violacé purple,

⁹ Richard E. Cytowic and David M. Eagleman, *Wednesday is Indigo Blue: Discovering the Brain of Synesthesia* (Cambridge: MIT Press, 2009), 39.

¹⁰ *Ibid.*, 14.

gold, ruby red, and stars of mauve, black and white. Blue-violet is dominant.”¹¹ In addition, synesthetes are rather consistent in their choice of colors given a set of sounds of varying pitch, timbre and texture.¹²

1.2. Synesthetic Composers

There are some notable composers known to be synesthetes: Leonard Bernstein (timbre-color), György Ligeti (grapheme-color), Franz Liszt (music-color), Olivier Messiaen (chordal structure-color), Nikolai Rimsky-Korsakov (musical keys-color), Jean Sibelius (sound-color), and Michael Torke (multiple synesthesiae). When Liszt worked as a Kapellmeister in Weimar, he used to say, “Oh please, a little bluer. This tone type requires it!” Or, “That is a deep violet, please, depend on it. Not so rose!”¹³ Other musicians are often associated with synesthesia, although they do not experience idiopathic synesthesia; this is most notable in the case of Scriabin, for whom synesthesia was strictly contrived for aesthetic purposes,¹⁴ most famously in relation to his orchestral work, *Prometheus: The Poem of Fire* (1910).

One of the most well-known composers of the 20th century, the synesthete György Ligeti (1923-2006) offers useful understanding of how synesthesia affects music.

¹¹ Claude Samuel, *Olivier Messiaen: Music and Color: Conversations with Claude Samuel*, translated by E. Thomas Glasow (Portland: Amadeus Press, 1994), 64.

¹² J. Ward; B. Huckstep; E. Tsakanikos, "Sound-colour synaesthesia: To what extent does it use cross-modal mechanisms common to us all?" *Cortex*, Vol. 42, Issue 2 (February, 2006), 264-280.

¹³ Quoted from an anonymous article in the *Neuen Berliner Musikzeitung* (August 29, 1895).

¹⁴ Kevin T. Dann, *Bright Colors, Falsely Seen: Synesthesia and the Search for Transcendental Knowledge* (New Haven and London: Yale University Press, 1998), 71-77. See also B. M. Galejev and I. L. Vanechkina, "Was Scriabin a Synesthete?" *Leonardo*; Vol. 34, Issue 4 (August 2001), 357-362.

Although Ligeti did not write specific combinations between music and color, he often talked about his synesthesia and described many of his experiences. His comments clearly indicate idiopathic synesthesia:

“I am inclined to synesthetic perception. I associate sounds with colors and shapes. Like Rimbaud [sic; Rimbaud was not a true synesthete], I feel that all letters have a color.” “Major chords are red or pink, minor chords are somewhere between green and brown. I do not have perfect pitch, so when I say that C minor has a rusty red-brown color and D minor is brown this does not come from the pitch but from the letters C and D. I think it must go back to my childhood. I find, for instance, that numbers also have colors; 1 is steely grey, 2 is orange, 5 is green. At some point these associations must have got fixed, perhaps I saw the green number 5 on a stamp or on a shop sign. But there must be some collective associations too. For most people the sound of a trumpet is probably yellow although I find it red because of its shrillness...”¹⁵

Cretien van Campen, a founder of Synesthetics Netherlands, wrote that Ligeti imagined music in pictures throughout his life, starting in early childhood;¹⁶ he suggests that Ligeti experienced a number of different types of synesthesia including colored letters, colored numbers, colored and shaped sounds, and colored chords. Furthermore, Ligeti was a spatial thinker whose sense of laterality had extra sensory characteristics: left and right each had different colors, sounds and textures. Ligeti described the music of Debussy as “the only music which leaves a lovely smell in the air.”¹⁷

¹⁵ György Ligeti, *Ligeti in conversation* (London: Eulenburg Books, 1983), 58.

¹⁶ Cretien van Campen, *The Hidden Sense: Synesthesia in Art and Science* (Cambridge: MIT Press, 2008), 22.

¹⁷ George Benjamin, “In the realm of the senses,” *The Guardian*, Thursday 22 February, 2007.

CHAPTER 2: THE INCLUSION OF COLOR OR LIGHT

INTO A COMPOSITIONAL METHOD

There have been many works in which a relationship between color and music is applied as artistic metaphor. Some simply apply color in the titles: each of the four movements in Arthur Bliss' *A Colour Symphony* (1922) corresponds to a different color; each prelude in Alexander László's *Eleven Preludes, Op. 10* (1925) is named after a color.¹⁸ Conversely, some visual artists allude to music in their artwork: McNeill Whistler's *Nocturne in Black and Gold* (1875); Georgia O'Keeffe's *Blue and Green Music* (1919); Albert Gleizes' *Symphony in Violet* (1930-31); and Paul Klee's *Polyphonie* (1932) are just a few of many examples.¹⁹

In 1932 in Paris, an artistic movement of relating music and color called the *Musicalisme* emerged around the painter Henry Valensi (1883–1960). With Charles Blanc-Gatti (1890–1966), Gustave Bourgogne (1888–1968), and Vito Stracquadaini (1891–1955), Valensi published the *Manifesto Musicalisme* and founded *l'Association des Artistes Musicalistes*. The movement attempted to translate music into painting, creating visual realizations of sound. Works by Frédéric Chopin, César Franck, Richard Wagner, Maurice Ravel, Arthur Honegger, Nicolai Rimsky-Korsakov, and Messiaen were described visually in their paintings, although in terms of synesthesia, this was a mere contrivance.²⁰ Messiaen's *La Nativité du Seigneur* was projected with “*décors*

¹⁸ Joseph Edward Harris, *Musique Colorée: Synesthetic Correspondence in the Works of Olivier Messiaen*, Ph.D. Dissertation (University of Iowa, 2004), 15.

¹⁹ *Ibid.*, 14.

²⁰ *Ibid.*, 15.

lumineux polychromes et dynamiques (polychromatic and dynamic luminous sets)” at their exhibition in 1936. A similar non-synesthetic deliberation led Scriabin to attempt to relate color and music.

In 1740, the French Jesuit scientist, Louis-Bertrand Castel published *L’Optique des couleurs*, a criticism of Newton’s spectral color description. Early on, he described his optical theories about color-sound correspondences for a *Clavecin pour les yeux* (Ocular Harpsichord, 1725), an instrument for the deaf to experience what music is like. This is the earliest instrument to attempt a creative synthesis of color and music.²¹ The ocular harpsichord consisted of a 6-foot square frame above a normal harpsichord. The frame had 60 small windows, each with a different colored-glass pane and a small curtain attached by pulleys to one specific key. Pressing a key caused the curtain a brief shaft to open, in turn allowing light of the corresponding color to shine through a piece of stained glass.²² Castel thought that color-music was like the lost language of paradise, where all the people spoke alike; thanks to his instrument, even the deaf could enjoy music as painted sound from the organ.²³ Although Castel took Newton’s spectrum as the basis for his color keyboard, the application to the notes was a bit different. The following color chart shows several note-color relationships used over three centuries deriving from Newton’s spectrum (Table 1).

²¹ James Peel, “The scale and the spectrum,” *Cabinet Magazine*, Issue 22 Insecurity Summer 2006. (<http://cabinetmagazine.org/issues/22/peel.php>)

²² William Moritz, “The dream of color music, and machines that made it possible,” *Animation World Magazine*, Issue 2.1, April 1997. (<http://www.awn.com/mag/issue2.1/articles/moritz2.1.html>)

²³ Peel, “The scale and the spectrum,” *Cabinet Magazine*, 2006.

Table 1: Note-color schemes over three centuries, by Fred Collopy (2004)
 Source from <http://rhythmiclight.com/archives/ideas/colorscales.html>

		Three Centuries of Color Scales											
		C	C#	D	D#	E	F	F#	G	G#	A	A#	B
Isaac Newton	1704	Red		Orange		Yellow	Green		Blue		Purple		Pink
Louis Bertrand Castel	1734	Blue	Teal	Green	Olive	Yellow	Orange	Red	Dark Red	Pink	Purple		
George Field	1816	Blue		Purple		Red	Orange		Yellow		Olive		Green
D. D. Jameson	1844	Red	Orange	Yellow	Green	Teal	Blue	Purple	Pink	Purple	Pink	Pink	Pink
Theodor Seemann	1881	Dark Red	Red	Orange	Yellow	Green	Teal	Blue	Purple	Pink	Dark Red	Black	
A. Wallace Rimington	1893	Red	Dark Red	Orange	Yellow	Green	Teal	Blue	Purple	Pink	Pink	Pink	Pink
Bainbridge Bishop	1893	Red	Dark Red	Orange	Yellow	Green	Teal	Blue	Purple	Pink	Pink	Pink	Pink
H. von Helmholtz	1910	Yellow	Green	Teal	Blue	Purple	Pink	Red	Orange	Red	Orange	Orange	Orange
Alexander Scriabin	1911	Red	Pink	Yellow	Blue	Red	Blue	Orange	Purple	Green	Blue	Blue	Blue
Adrian Bernard Klein	1930	Red	Red	Orange	Yellow	Green	Teal	Blue	Purple	Pink	Pink	Pink	Pink
August Aeppli	1940	Red		Orange		Yellow		Green	Teal		Blue	Purple	Purple
I. J. Belmont	1944	Red	Orange	Yellow	Green	Teal	Blue	Purple	Pink	Pink	Pink	Pink	Pink
Steve Zieverink	2004	Yellow	Green	Teal	Blue	Purple	Pink	Red	Orange	Red	Orange	Yellow	Yellow

© 2004, Fred Collopy—RhythmicLight.com

After Castel, many other people developed color organs to create visual music. In 1893, British painter Alexander Wallace Rimington invented the *Clavier à lumières*. Rimington's color organ drew considerable attention, including from Richard Wagner and Sir George Grove.²⁴ Rimington took advantage of the increased possibilities in projecting light created by electricity, but his organ did not produce musical sounds.²⁵ One of Rimington's instructions in his book for the organ was that a Wagnerian trumpet-blast might be "flooded by an intense orange which palpitates with the harmonic colors corresponding to a subordinate passage upon some of the other orchestral instruments. The blast ceases, there is a faint echo of it upon the violins while the screen pulsates with

²⁴ Alexander Wallace Rimington, *Colour-Music The Art Of Mobile Colour* (Hutchinson: London, 1912), viii.

²⁵ Peel, "The scale and the spectrum," *Cabinet Magazine*, 2006.

pale lemon and saffron, hardly discernible. Again comes the blare of the trumpets, and once more the screen flames with orange modulations."²⁶ This use of color organ influenced Scriabin's attempt at reflecting colors in *Prometheus*, which the score called for executing with a "tastiéra per luce" or "clavier à lumières" (keyboard with lights), designed to project colored lights with pitch-color correlations. The 1915 New York premiere of *Prometheus* was accompanied by lighting engineer Preston S. Millar's Chromola, which was similar to Rimington's instrument.²⁷

2.1. Alexander Scriabin, *Prometheus: Poem of Fire* (1910)

While Russian composer Alexander Scriabin (1872–1915) is regarded by many historians as a synesthete, there is nothing in his history to suggest that he ever experienced the involuntary, consistent, and lifelong photisms²⁸ characteristic of genuine synesthetes.²⁹ There was a broad range of interest in cross-sensory phenomena at this time. It is true that Scriabin found his synesthetic sense at a concert with Rimsky-Korsakov, when they agreed that D was yellow. However, based on Cytowic's criteria, his colored hearing was more artificial and more carefully worked-out than the process of genuine neurological synesthetes' mappings of color onto music.

²⁶ Rimington, *Colour-Music: The Art of Mobile Colour*, 60.

²⁷ Kerry Brougher; Judith Zilczer; Jeremy Strick; Ari Wiseman; Olivia Mattis, *Visual Music: Synaesthesia in Art and Music Since 1900* (Thames & Hudson, 2005).

²⁸ The production of a sensation of light or color by a stimulus to another sense organ, such as that of hearing or touch (The American Heritage Medical Dictionary).

²⁹ Cytowic and Eagleman, *Wednesday is Indigo Blue: Discovering the Brain of Synesthesia*, 188.

Instead, Scriabin intellectually applied his ideas about color in the orchestral piece *Prometheus: The Poem of Fire*, Op. 60 (1910). These ideas were strongly influenced by theosophy, as Scriabin subscribed to the theosophical tenets of Russian occultist Helena Blavatsky. In her book *Secret Doctrine: The Synthesis of Science, Religion, and Philosophy* (1885–88), Blavatsky indicated a correlation between pitch and color.³⁰ These were based on the C-major scale, with the order of the notes mapped onto the visible spectrum: C-red; D-orange; E-yellow; F-green; G-blue; A-indigo; B-violet. In *Prometheus*, Scriabin employed mapping based on perfect fifths: C-red; G-orange; D-brilliant yellow; A-green; E-bluish white; B-bluish-white (again); F#-bright blue; Db-violet; Ab-purple violet; Eb-steel color with a metallic lustre; Bb-same as Eb; F-deep red. Scriabin's friend and biographer, Leonid Sabaneev explained Scriabin's formation of his system:

“I know that originally he recognized clearly no more than three colors—red, yellow, and blue, corresponding to C, D, and F-sharp respectively. The others he deduced rationally, as it were, starting from the assumption that related keys correspond to related colors; that in the realm of color the closest relationship coincides with proximity in the spectrum; and that as regards tonalities it is connected with the circle of fifths.”³¹

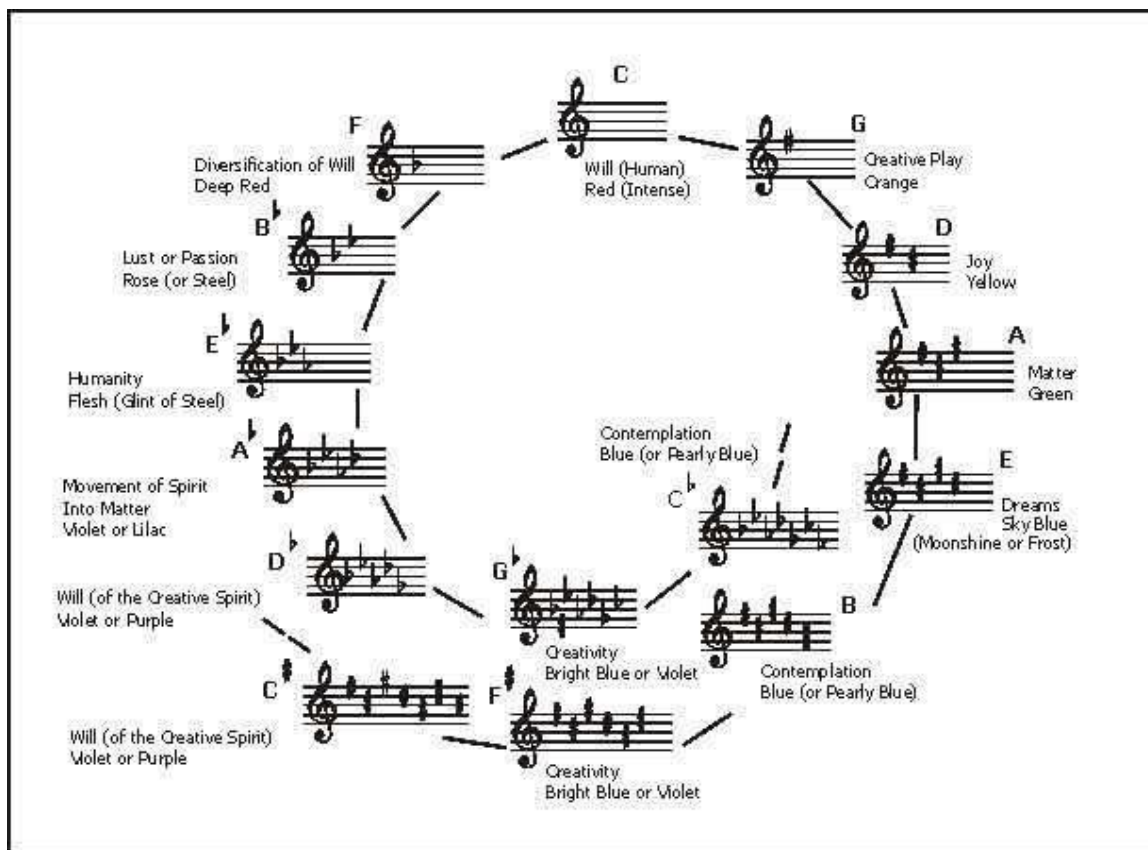
Irina Vanechkina and Bulat Galejev, authors of the Research Institute

“Prometheus” (Russia, Kazan) further developed Scriabin's color system by adding emotions to the correspondences (Table 2). The Dover edition (1995) and Eulenburg edition (ca. 1980) include this diagram in the score.

³⁰ Harris, *Musique Colorée: Synesthetic Correspondence in the Works of Olivier Messiaen*, 17.

³¹ Leonid Sabaneev, “The Relation Between Sound and Color,” translated by S. W. Pring, *Music and Letters* 10, no. 3 (July 1929), 273.

Table 2: “Musico-Chromo-Logo Schema,” developed by Vanechkina and Galejev (1975)
 Scriabin used this system of color/scale/emotional impact
 in *Prometheus: The Poem of Fire*
 Source from http://www.liveart.org/motherboard/synaesthesia/lectureimgs_280806.html



For *Prometheus*, Scriabin added an additional staff for “Luce (light)” at the top of the score (Example 2); according to the composer, the instrument should be a muted keyboard that could project the colored “Luce” in the form of beams or clouds, flooding the concert hall. The colors were shown on a huge box above the orchestra, which contained eight by ten-foot screens of different degrees of transparency.³² Scriabin had two related requests for the performance: that the audience all wear white clothes, and

³² Peel, “The scale and the spectrum,” *Cabinet Magazine*, 2006.

that the work culminate with a white light so strong that it would be painful to the eyes. But after the New York performance, most of the reviews said that it was hard to relate the timing and the colors to the music; while Scriabin imagined the work as a spectacular “dual symphony” of light and sound, the lighting was technically difficult to realize. The first “satisfactory” *Prometheus* is considered to be the performance by the University of Iowa orchestra, with a special laser apparatus designed by Lowell Cross, in 1975.³³

³³ Kay Marie Stolba, *The Development of Western Music: A History* (Dubuque: Wm. C. Brown Publisher, 1990), 743.

In the score, the two-part Luce is notated with pitches in treble clef. The upper part constantly changes a note, producing the color associated with each key. It indicates a new chord and always moves to the root of the harmony. The lower part concerns the longer notes surrounding the concert hall as background. The use of musical notation made it possible for Scriabin to express the coordination of color, duration, lighting dynamics, and special effects.³⁴ According to a musicologist Nicholas Cook, Scriabin's use of musical symbols for the color organ "subordinates colors to musical principles."³⁵ However, in the first edition, there were no further instructions for the lights. After the unsuccessful Moscow premiere in 1911, Scriabin added notes for the Luce in the Parisian score in 1913 (Example 3). This Parisian score gives much more information regarding the realizations of the lights, but the Sabaneev³⁶ estate held the score privately; it was not available until 1978, when it was archived at the Bibliothèque Nationale in Paris. There is still no published edition, and the manuscript's existence has not been widely publicized.³⁷

³⁴ Anna M. Gawboy and Justin Townsend, "Scriabin and the Possible," *Music Theory Online*, a journal of the Society for Music Theory, Volume 18, Number 2, June 2012. (http://mtosmt.org/issues/mto.12.18.2/mto.12.18.2.gawboy_townsend.php)

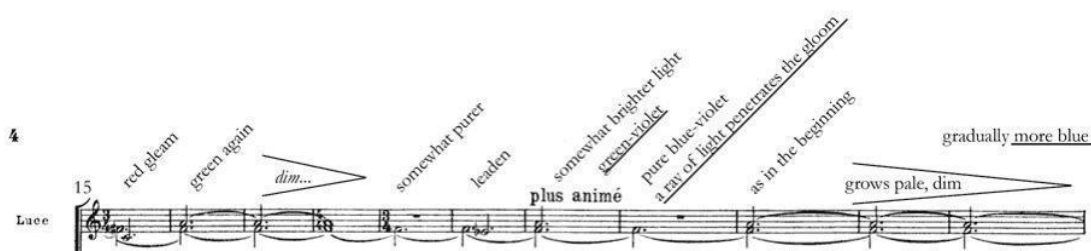
³⁵ Nicholas Cook, *Analysing Musical Multimedia* (Oxford: Oxford University Press, 1998), 37.

³⁶ Leonid Sabaneev was Scriabin's friend and biographer.

³⁷ Gawboy and Townsend, "Scriabin and the Possible," *Music Theory Online*, June 2012.

Example 3: *Prometheus*, mm. 15–25, Scriabin's annotations for the Luce part
(translated from the Parisian score)

Source from http://mtosmt.org/issues/mto.12.18.2/mto.12.18.2.gawboy_townsend.php



In mm.15-25, while the lower part sustains F#, the upper voice moves within a diminished seventh chord (F#-A-C-Eb) while changing colors. When the notes in the Luce staff are realized, the lights project the colors corresponding to the pitches, not the sound of those pitches. The dynamics in the score represent the intensity of the lights.

Sabaneev claimed that Scriabin composed *Prometheus* entirely from transpositions of the mystic chord [0 1 4 6 8 t].³⁸ In mm.1-4, the music begins with a sustained mystic chord based on A. The upper note of the Luce indicates the root of the chord (Example 4).

Example 4: *Prometheus*, mm.1-4 (reduced score), A-mystic chord (A-B-C#-D#-F#-G)

Lento. Brumeux. M.M. ♩=60

³⁸ Leonid Sabaneev, "Scriabin's Prometheus," In *The Blaue Reiter Almanac*, edited by Wassily Kandinsky and Franz Marc, translated by Henning Falkenstein (London: Thames and Hudson, 1974), 127–44.

Interestingly, although Scriabin did not compose *Prometheus* using major keys, each mystic chord has something in common with the major key with which it shares a root (Table 3). For example, G-mystic chord (G-A-B-C#-E-F) has one sharp, as does G major; likewise, the Bb-mystic chord (Bb-C-D-E-G-Ab) and Bb both have two flats, though the pitches are not the same.³⁹

Table 3: The relationship between mystic chords and major keys

C-mystic chord (C-D-E-F#A-Bb): 1 flat, 1 sharp
G-mystic chord (G-A-B-C#-E-F): 1 sharp
D-mystic chord (D-E-F#-G#-B-C): 2 sharps
A-mystic chord (A-B-C#-D#-F#-G): 3 sharps
E-mystic chord (E-F#-G#-A#-C#-D): 4 sharps
B-mystic chord (B-C#-D#-E#-G#-A): 4 sharps
F#(Gb)-mystic chord (F#-G#-A#-B#-D#-E): 5 sharps
Db-mystic chord (Db-Eb-F-G-Bb-Cb): 4 flats
Ab-mystic chord (Ab-Bb-C-D-F-Gb): 3 flats
Eb-mystic chord (Eb-F-G-A-C-Db): 2 flats
Bb-mystic chord (Bb-C-D-E-G-Ab): 2 flats
F-mystic chord (F-G-A-B-D-Eb): 1 flat

Scriabin planned another work, *Mysterium*, when he began writing *Prometheus* around 1908. Where *Prometheus* was focused on music and light, Scriabin deliberated on ways to arouse all five senses in the unfinished *Mysterium*.⁴⁰

³⁹ Gawboy and Townsend, "Scriabin and the Possible," *Music Theory Online*, June 2012.

⁴⁰ Boris Schloezer, *Scriabin: Artisi and Mystic*, translated by Nicolas Slonimsky (Berkeley: University of California Press, 1987), 254-58.

2.2. Olivier Messiaen, *Couleurs de la cité céleste* ("Colors of the Celestial City") (1963)

“When I listen to music, I see corresponding colors,” emphasized Messiaen once during a speech; “these are wonderful and indescribable colors of extraordinary diversity. Just as sounds stir, change, and move, in correspondence these colors move in constant metamorphoses.”⁴¹ Unlike Scriabin, Messiaen was a genuine synesthete, with a distinct bi-directional sense of sound and color; he perceived specific colors when he heard certain musical chords, particularly those built from his modes, and combinations of these colors were important in his compositional process. During a conversation with Claude Samuel, Messiaen mentioned that the first and most interesting way of conceiving color was the sound-color relationship perceived physiologically.⁴² This innovative use of color is a signature distinction of Messiaen's music.⁴³

Notably, Messiaen felt that the terms “tonal,” “modal,” “serial,” and other words of this ilk were misleading and that their use constituted an illusion.⁴⁴ For him there were no modal, tonal or serial compositions, only music that was colored or without color.⁴⁵ He said that Mussorgsky, Stravinsky, and Monteverdi were colored, as was Chopin; he

⁴¹ Speech on the occasion of the Erasmus award ceremony in 1971, quoted from Aloyse Michaely, *Die Musik Olivier Messiaens: Untersuchungen zum Gesamtschaffen*, in *Hamburger Beiträge zur Musikwissenschaft*, special edition (Hamburg: Wagner, 1987), 214.

⁴² Samuel, *Olivier Messiaen: Music and Color: Conversations with Claude Samuel*, 40.

⁴³ <http://en.wikipedia.org/wiki/Messiaen>

⁴⁴ Samuel, *Olivier Messiaen: Music and Color: Conversations with Claude Samuel*, 49.

⁴⁵ *Ibid.*, 63.

pointed to the extraordinary color changes he heard in the Etudes, Preludes, Ballades, the Scherzo of the Sonata in B-flat Minor, and the finale of the Sonata in B Minor.⁴⁶

Messiaen's use of color was neither representational nor metaphorical. Messiaen never drew inspiration for a work from the colors of a painting.⁴⁷ Likewise, when he annotated music with specific colors (such as in *Couleurs de la cité céleste* and *Des canyons aux étoiles...*), his purpose was to help the conductor in understanding the piece, rather than to specify which colors the audience should experience. Rather, the importance of color is related to Messiaen's synesthesia. In his treatise *Traité de rythme, de couleur, et d'ornithologie* ("Treatise of Rhythm, Color and Birdsong"), Messiaen wrote descriptions of the colors of certain chords. From Messiaen's description, the musicologist Jonathan Bernard distinguished three basic types of color categories: monochromatic color, two mixed colors, and combinations of varying complexity. For example, the first type of chord is a simple color like "red" or "green." The second type is more complex than the first and uses hyphenated names, such as "violet-blue" or "grey-rose." The last type is from pairs or triplets of colors ("red and gold" or "orange, gold, and milky white") to parallel or vertical bands of three colors simultaneously ("transparent sulphur yellow with mauve reflections and little patches of Prussian blue and brown purplish-blue"). There may be a dominant color that is striped or flecked by other colors.⁴⁸

⁴⁶ Ibid., 62-63.

⁴⁷ Ibid., 41.

⁴⁸ Olivier Messiaen, *Traité de rythme, de couleur, et d'ornithologie*, Vol. VII (Paris: Leduc, 2002), 95-190. See also Jonathan W. Bernard, "Messiaen's Synaesthesia: The Correspondence between Color and Sound Structure in His Music," *Music Perception*, Fall 1986, Vol. 4, No. 1, University of California Press, 41-68.

These three types of complex colors are constructed explicitly in musical chord structures that he invented.⁴⁹ In many of Messiaen's works, he wished to express the marvelous aspects of the Roman Catholic Faith, and he said his love of nature was closely yet independently linked to the Faith.⁵⁰ Messiaen strongly believed that color music helped to overcome conventional perception to bring about a state of *being blinded* that ultimately lead to faith, similarly to church windows of the Middle Ages.⁵¹ He also compared *Couleurs de la cité céleste* to the "rose window of a cathedral in flaming and invisible colors."⁵²

Based on the Apocalypse from the Book of Revelations, Messiaen began this piece in 1963 and combined his color chords, bird songs, and Gregorian chant with Hindu and Greek rhythms in the music to symbolically portray the Holy City. In the preface to the score, he wrote:

The form of this work depends entirely on colors. The melodic or rhythmic themes and the complexes of sounds and timbres evolve like colors. In their perpetually renewed variations, we can find (by analogy) warm and cool colors, and complementary colors that influence their neighbors, degraded color to white or toned down to black. These transformations can be compared to the superimposition of plays enacted on several stages, the simultaneous unfolding of several different stories.

Alleluias of plainchant, Hindu and Greek rhythms, permutations of durations, and birdsongs from different countries were all collected and used in this work. All these accumulated materials are put at the service of color and of the combinations of sounds that assume and call out for it.

⁴⁹ Cytowic and Eagleman, *Wednesday is Indigo Blue: Discovering the Brain of Synesthesia*, 309.

⁵⁰ Samuel, *Olivier Messiaen: Music and Color: Conversations with Claude Samuel*, 34.

⁵¹ Barbara Kienscherf, in the description of *Couleurs de la cité céleste*. (<http://www.see-this-sound.at/works/216>)

⁵² Michaely, *Die Musik Olivier Messiaens: Untersuchungen zum Gesamtschaffen* (1987), 233.

The sound-colors, in their turn, are a symbol of the “Celestial City” and of “Him” who dwells there. Above all time, above all place, in a light without light, in a night without night... That which the Apocalypse, still more terrifying in its humility than in its visions of glory, describes only in a glare of colors...

To the song of two New Zealand birds is opposed "the abyss", with its pedal sounds of the trombones and the resonance of clarinets, wrapping the tam-tams. To the cries of the Brazilian Araponga is opposed "the colored ecstasy" of organ points: carnelian red - red patch of blue - orange, gold, milky white - emerald green, amethyst violet - violet purple and blue violet. The work ends no differently from the way it began, but turning on itself like a rose-window of flamboyant and invisible colors...⁵³

Messiaen's first public acknowledgment of color as a role of his compositional process occurs in his book, *Technique de Mon Langage Musical* (“The Technique of My Musical Language,” 1944, Vol. 1, p. 51), in a passing reference to “the gentle cascade of blue-orange chords” in the piano part of the second movement of his *Quatuor pour la fin du temps* (1941) (Example 5).⁵⁴

Example 5: *Quatuor pour la fin du temps*, 2nd movement, mm. 19-20

The image shows a musical score for measures 19-20 of the second movement of *Quatuor pour la fin du temps*. The score is for voice (V on, V elle) and piano (p). The tempo is 'Presque lent, impalpable, lointain (♩=50 env.)'. The voice parts are marked 'sourdine' and 'pp'. The piano part is marked 'ppp gouttes d'eau en arc-en-ciel'.

⁵³ Composer's first note in the score, *Couleurs de la cité céleste*. Paris: Leduc, 1966. Translated by the author.

⁵⁴ Bernard, "Messiaen's Synesthesia: The Correspondence between Color and Sound Structure in His Music," 41.

However, this color-sound relationship as the important factor of his compositional process became more clear about twenty years later in the *Sept Haïkai* (1962) and *Couleurs de la cité céleste* (1963), in which specific colors are precisely labeled to the corresponding chords (Example 6).⁵⁵ Since these labels reflect his consistent color responses, exploring the correlations between color and sound could help in understanding Messiaen's color associations on his music.

Example 6: *Couleurs de la cité céleste*, [75] and [76]



Messiaen used only four modes (Nos. 2, 3, 4, and 6) from his well-known *modes of limited transposition* for the color chords. Table 4 shows the four modes with pitch-class numbers.

Table 4: Messiaen's Color Modes

<Mode 2>

0 1 3 4 6 7 9 t
1 2 4 5 7 8 t e
2 3 5 6 8 9 e 0

<Mode 3>

0 2 3 4 6 7 8 t e
1 3 4 5 7 8 9 e 0
2 4 5 6 8 9 t 0 1
3 5 6 7 9 t e 1 2

⁵⁵ Together with *Chronochromie* (1959/1960), these works highlight his creative interaction with the possibilities provided by color music. Kienschurf, in the description of *Couleurs de la cité céleste*. (<http://www.see-this-sound.at/works/216>)

<Mode 4>

0 1 2 5 6 7 8 e
 1 2 3 6 7 8 9 0
 2 3 4 7 8 9 t 1
 3 4 5 8 9 t e 2
 4 5 6 9 t e 0 3
 5 6 7 t e 0 1 4

<Mode 6>

0 2 4 5 6 8 t e
 1 3 5 6 7 9 e 0
 2 4 6 7 8 t 0 1
 3 5 7 8 9 e 1 2
 4 6 8 9 t 0 2 3
 5 7 9 t e 1 3 4

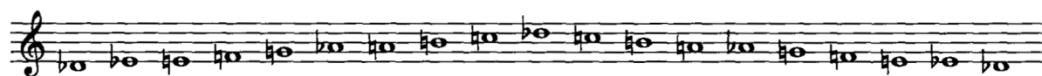
For Messiaen, there was an immediate link between sets of sounds (modes, chords) and color combinations.⁵⁶ He noted, for example, on the 3rd mode, 2nd transposition that “horizontal bands layered on top of each other: from bottom to top: dark gray, mauve, light gray, and white with mauve and light yellow reflexes – with bright, golden letters from an unknown language, and a small amount of red or blue curves, very thin, very fine, barely visible. Dominant colors: gray and mauve”(Example 7).⁵⁷

⁵⁶ Kienscherf, in the description of *Couleurs de la cité céleste*. (<http://www.see-this-sound.at/works/216>)

⁵⁷ Messiaen, *Traité de rythme, de couleur, et d'ornithologie*, Vol. VII (Paris: Leduc, 2002), 122.

Example 7: Messiaen's note on Mode 3, 2nd transposition

Mode 3²



Mode 3², en accords parallèles :



3², Couleur générale :

Bandes horizontales étagées : de bas en haut : gris foncé, mauve, gris clair, et blanc à reflets mauve et jaune pâle – avec des lettres d'or flamboyantes, d'une écriture inconnue, et une quantité de petits arcs rouges ou bleus, très minces, très fins, à peine visibles.

Dominante : gris et mauve.

The following is Messiaen's color description of each mode.⁵⁸

Mode 2 ¹	blue violet
Mode 2 ²	gold, brown
Mode 2 ³	green
Mode 3 ¹	orange, gold, milky white
Mode 3 ²	gray, mauve
Mode 3 ³	blue, green
Mode 3 ⁴	orange, red, with a little blue
Mode 4 ¹	gray, gold
Mode 4 ²	reflections: iron gray, pink mauve and coppery yellow, black and clear Prussian blue, green and purple violet
Mode 4 ³	yellow, violet
Mode 4 ⁴	a bit like the petunia flowers: dark violet, white drawing violet, violet purple

⁵⁸ Ibid., 118-134.

Mode 4 ⁵	deep violet, with mauve gray areas This transposition is the best and perhaps the most characteristic. If we play the Mode 4 ⁵ chords in the low register, becomes dark violet, strongly folded by the black, with almost completely black areas.
Mode 4 ⁶	carmine red, violacé purple, mauve gray, pink gray
Mode 6 ¹	large gold letters on a gray background, with orange spots pellets, and quite dark green branches with golden reflections
Mode 6 ²	leather color and chocolate, with reddish orange areas, and dark violet – some pale mauve and gray clouds
Mode 6 ³	transparent yellow sulfur, mauve glints, with blue corners Prussian and violacé brown
Mode 6 ⁴	yellow vertical stripes, violet, and black
Mode 6 ⁵	gold, pale blue, violet, with brown drawings
Mode 6 ⁶	black and white vertical stripes, dotted with pale blue moons

As Messiaen noted in the preface to the score and also in the last volume of his *Traité de rythme, de couleur, et d'ornithologie, Couleurs de la cité céleste* is based on the Apocalypse from the Book of Revelations, and the “inner colors” spring from five citations of the Apocalypse:⁵⁹

1. “And the one who sat there had the appearance of jasper and carnelian. A rainbow that shone like an emerald encircled the throne.” (Revelations 4:3)
2. “Then the seven angels who had the seven trumpets prepared to sound them.” (Revelations 8:6)
3. “The fifth angel sounded his trumpet, and I saw a star that had fallen from the sky to the earth. The star was given the key to the shaft of the Abyss.” (Revelations 9:1)
4. “But after the three and a half days a breath of life from God entered them, and they stood on their feet, and terror struck those who saw them.” (Revelations 11:11)
5. “The foundations of the city walls were decorated with every kind of precious stone. The first foundation was jasper, the second sapphire, the third agate, the

⁵⁹ Ibid., 218.

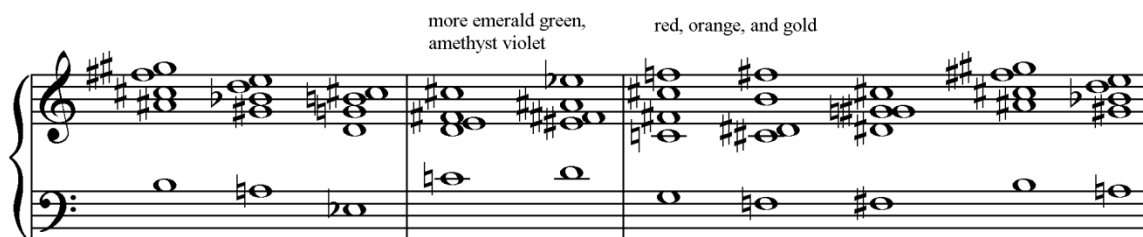
fourth emerald, the fifth onyx, the sixth carnelian, the seventh chrysolite, the eighth beryl, the ninth topaz, the tenth turquoise, the eleventh jacinth, and the twelfth amethyst.” (Revelations 21:19-20)

Portions of these verses are written in the score where the music represents them. He also added a brief analysis of the structure for this piece in *Traité de rythme, de couleur, et d'ornithologie*.⁶⁰ Based on his analysis, rehearsal numbers [11], [13], [18], [24], [26], and [73] – [76] have color chords:

[11] – Yellow topaz, chrysoprase pale green, and crystal



[13] – To [11], more emerald green, amethyst violet – red, orange, and gold.



[18] – Same colors as [11]

[24] – Emerald green, amethyst violet – carnelian red, blue sapphire, and gold – pink, mauve, and gray.

⁶⁰ Ibid., 220-221.

emerald green,
amethyst violet carnelian red emerald green,
blue sapphire, and gold pink, mauve, and gray

26 – Carnelian red – emerald green, blue sapphire, and gold – pink, mauve, and gray.

Carnelian red emerald green,
blue sapphire, and gold pink, mauve, and gray.

73 – Carnelian red – total chromatic

74 – Red, stained blue – total chromatic

75 – Blue violet – Mode 2 – orange, gold, milky white – Mode 3

Blue violet Mode 2 Orange, gold,
milky white Mode 3

76 – Violet – Mode 4 in its 5th transposition

In an interview with Claude Samuel, Messiaen explained his effort to express these colors in the music:

“So I’ve tried to translate into my work the colors mentioned in the Apocalypse, and I don’t think I’ve ever gone so far with the sound-color relationship: certain sound combinations really correspond to certain color combinations, and I’ve noted the names of these colors in the score in order to impress this vision upon the conductor, who will, in turn, transmit this vision to the players he directs. The brass should, if I dare say, “play red”; the woodwinds should “play blue,” and so on.”⁶¹

He felt this piece to be like a stained-glass window, in which small figures of colors produce a big picture when viewed at a distance. In this way, the small fragments of musical ideas create an image of the celestial city, Jerusalem, which is to say paradise.⁶²

According to all of Messiaen’s descriptions of harmonic colorations in the *Traité*, the following pitch-color correspondences can be considered:⁶³

C	clear
C#/Db	blue green
D	gray green
D#/Eb	violet
E	gray blue
F	copper (red/green)
F#/Gb	sparkle
G	yellow
G#/Ab	violet
A	blue
A#/Bb	violet
B	deep red

⁶¹ Samuel, *Olivier Messiaen: Music and Color: Conversations with Claude Samuel*, 139.

⁶² Brian K. Shepard, “The symbolic elements of Messiaen’s work for wind ensemble, *Couleurs de la cité céleste*,” *Journal of Band Research*, Vol. 18, No. 1 (Fall 1982), 55.

⁶³ Harris, *Musique Colorée: Synesthetic Correspondence in the Works of Olivier Messiaen*, 37.

Messiaen stated: “For me, certain sound complexes and sonorities are linked to complexes of color, and I use them in full knowledge of this.”⁶⁴ In compositions such as *Couleurs de la cité céleste*, *L’ascension*, and *Des canyons aux étoiles...*, this role of color in the functionality and symbolism of his works is such that, when asked what Messiaen's main influence had been on composers, George Benjamin said, “I think the sheer color has been so influential, [...] rather than being a decorative element, the color could be a structural and fundamental element, [...] the fundamental material of the music itself.”⁶⁵

2.3. Unsuk Chin, *Rocaná* for large orchestra (2008)

Unsuk Chin has been acclaimed for her “formidable ear for sonority and for mining the expressive potential of the slightest nuances of pitch and pulse.”⁶⁶ Born in Seoul, Korea in 1961, she moved to Hamburg in 1985 and began studying with György Ligeti, whose deep individualism and avoidance of established stylistic currents had a strong influence on Chin’s unbridled use of musical styles to achieve her expressive aims.⁶⁷

⁶⁴ Samuel, *Olivier Messiaen: Music and Color: Conversations with Claude Samuel*, 40-41.

⁶⁵ George Benjamin, speaking in interview with Tommy Pearson, broadcast on BBC during an interval at the 2004 Proms, where Benjamin conducted a performance of *Des canyons aux étoiles...* The full quote: “I think the sheer – the word he loved – color has been so influential. People, composers, have found that color, rather than being a decorative element, could be a structural, a fundamental element. And not color just in a surface way, not just in the way you orchestrate it – no – the fundamental material of the music itself. More than that I can't say except that for my own small world he was incredibly important, and an exceptionally special and indeed wonderful person. I met him when I was very young (I was 16) and stayed closely in touch with him until he died in 1992, and was immensely fond of him...”

⁶⁶ The Guardian, United Kingdom. Entry derived from <http://www.boosey.com/composer/unsuk+chin>

⁶⁷ Robert Kirzinger, in a program note for the U. S. premiere of her *Concerto for Cello and Orchestra* on Feb. 10th in 2011, Boston.

Chin writes music which is “modern in language, but lyrical and non-doctrinaire in communicative power.”⁶⁸ She resists categorization of her style: “It would be easier if I had a definable style, but I’m not interested in establishing my name. That’s why I’m pretty much an outsider in Germany.”⁶⁹ Her musical style is not limited in a certain language, but rather free in that she uses any number of musical styles to express her sound. Chin’s output features both electronic and acoustic scores – her continuous interest in working with electronic music has affected her treatment of acoustic instruments, as in *Rocaná* – and components of Western and non-Western music. She is also well known for having an acute ear for instrumentation, orchestral color, and rhythmic imagery.⁷⁰

Ligeti’s influence extends to both Chin’s musical style and general interests. According to Chin, Ligeti was very interested in Lewis Carroll’s “Alice” stories, and wanted to write an opera based on the character. The stories infected Chin as well, and her first opera, *Alice in Wonderland*, premiered at the Bavarian State Opera in 2007 as part of the Munich Opera Festival. Her second opera, *Alice through the Looking Glass*, is commissioned by The Royal Opera in London for premiere in the 2018/19 season. Especially, in *Akrostichon-Wortspiel* (Acrostic-Wordplay), seven scenes from fairy-tales for soprano and ensemble, there are also hints of the later Ligeti – the Violin Concerto, in

⁶⁸ http://www.boosey.com/pages/cr/composer/composer_main.asp?composerid=2754&ttype=SNAPSHOT&ttitle=Snapshot

⁶⁹ <http://c-within.blogspot.com/2009/04/chin-unsuk-goes-to-hell-and-back-for.html>

⁷⁰ http://www.boosey.com/pages/cr/composer/composer_main.asp?composerid=2754&ttype=SNAPSHOT&ttitle=Snapshot

particular – in the “simple malleability of the material, and the amusing yet delicate fantasy with which text and music combine.”⁷¹

Example 8: *Akrostichon-Wortspiel*, 1st movement, “Versteckspiel,” opening

The musical score is for the opening of the first movement of "Versteckspiel" from the work *Akrostichon-Wortspiel*. It is written for a large ensemble. The instruments listed on the left are: Fl. in G, Ob., Kla. in B, Mand., HF. 1, Pf., Schlg., solo Sop., Vn., Bra., and K.B. The tempo is marked "tempo I" and "tempo II". The key signature is A major (A, B, C, D, E, F#, G#). The time signature is 3/4. The score includes various musical notations such as notes, rests, and dynamic markings like "ppp" and "f". Text annotations include "geheimnistvoll", "Sulla tavola", "Vib. mit Streichenbogen", "Ant. Zimbeln mit Holzstäbchen", "siva", "U.G.", "mit Flüsterton", "wa-re-be-ra", "let", "sui pont. Flauto", and "sempre".

Also in a program note for her cello concerto, Chin’s music is explained: “her works often feature brilliant surface activity and textures of highly active individual parts, as well as the use of unusual combinations of instruments and extended playing

⁷¹ Arnold Whittall, “Unsusuk Chin in Focus: Meditation & Mechanics,” *The Musical Times*, Vol. 141, No. 1870 (Spring 2000), 21.

techniques to create interesting, unique sounds. She has been greatly influenced by recent aesthetic and technical inquiry and research into the harmonic details of timbre leading her frequently to use overtone-based harmonies, a tendency also of Ligeti in his later work.”⁷² Chin is particularly interested in color and the volatility of sound. She is familiar with the interaction between synthetic and instrumental sounds through her continuing work in the electronic studio, but in many of her compositions has also experimented with the use of purely instrumental means to produce sounds with subtly nuanced color values and shadings.

While Chin has never said that she has “a specific synesthesia” regarding color and sound, it is not unusual to perceive colors in her other pieces. The colors in this case do not mean orchestral timbre, but refer to their visual comprehensibility. In April 2013, I met Chin in New York before the U.S. premiere of her piece *Gougalon* with New York Philharmonic Orchestra. I asked her if she had a specific synesthesia, since most critics described her music as being generally based on color. Instead of replying directly, she explained that her music was constructed with many other elements in mind besides color, but it is the aspect of color most frequently commented on. During her stay, I attended rehearsals, with the score, which helped a lot in understanding her sound technique.

Chin’s *Rocaná* – Sanskrit, “Room of Light” – is a reference to Chin’s exploration of the relationship between light and sound waves. For the composer, the title refers to the character of the work as well as to the compositional techniques employed. In an interview, she stated: “in *Rocaná* I was concerned with the behavior of beams of light – their distortion, refraction, reflections, and undulations... The overall picture and the

⁷² Program note by Robert Kirzinger, “Boston Symphony Orchestra, 2010-2011 Season, Week 15,” 43.

overall structure are one entity, one ‘tonal sculpture.’ However, one can look at it from various angles, since the inner structures are constantly changing. Even if the music at times gives the impression of stasis, subtle impulses, interactions, and reactions are continually present.” The title represents this work’s main features, and the twenty minutes of music are an aural manifestation of a room filled with light. While Messiaen’s *Couleurs de la cité céleste* describes the colors of the heavenly city with sound by using color chords based on his synesthesia, the instruments in *Rocaná* are spurting out all kinds of light in the room.

The music in *Rocaná* flows uninterruptedly for about twenty minutes. When I first heard this piece, I couldn’t find any breathing point because of the tension in the music. Just before the performance, the conductor and dedicatee of the piece, Kent Nagano, briefly explained that Chin tried to convey the sensation of light; he compared the piece to viewing the northern lights, a phenomenon that appears to be motionless, but is a riot of cosmic energy. Certain elements keep appearing time and again, but always in varied form. The elements are not developed; they instead lead seamlessly into one another and blend, forming new interactions and processes.

The composer once pointed out that because of her cultural background she has “a certain aversion to the sound world produced by traditional symphony orchestras rooted in 19th-century aesthetics,” and said, “I feel a great deal of affinity for non-European musical cultures. That is why I always try to introduce a completely different color into my compositions based on my experience of non-European music.” In *Rocaná*, the instrumentation is more or less standard, but an attempt has been made to treat the orchestra like a “super-instrument,” as well as like a virtuoso “illusion machine” that

creates something new out of that which is familiar.⁷³ In the program note, the music is described as follows: “shifts and changes of timbre are achieved through the combination of various instrumental techniques, rhythmic development, and the interplay of overtone structures and microtones; light and color phenomena playfully alternate with one another.”⁷⁴

“My music is a reflection of my dreams. I try to render into music the visions of immense light and of an incredible magnificence of colors that I see in all my dreams, a play of light and colors floating through the room and at the same time forming a fluid sound sculpture. Its beauty is very abstract and remote, but it is for these very qualities that it addresses the emotions and can communicate joy and warmth.”⁷⁵ Since sound waves – as the physical phenomenon of a bodiless oscillation – are similar to light waves, music seems the appropriate medium for a “translation” of light phenomena.⁷⁶ Such a description cannot but help to bring to mind the ecstatic visions of Hildegard von Bingen. As in Hildegard’s songs, like those in the *Symphonia*, as always, she responded to her visionary voice as it came to her, and it is doubtful she structured her songs in advance.⁷⁷

Chin is working with the kind of refinements in pitch that comes most easily to the electro-acoustic composer. After the *Rocaná* premiere, the Chicago Tribune critic,

⁷³ Program note by Maris Gothoni (translation by Howard Weiner)

⁷⁴ Ibid.

⁷⁵ Unsuk Chin, 2003.

(http://www.boosey.com/pages/cr/composer/composer_main.asp?composerid=2754&ttype=SNAPSHOT&ttile=Snapshot)

⁷⁶ Program note by Maris Gothoni (translation by Howard Weiner)

⁷⁷ Anne H. King-Lenzmeier, *Hildegard of Bingen: An Integrated Vision* (Minnesota: The Liturgical Press, 2001), 87.

John von Rhein wrote an article, “her orchestral writing shows the coloristic acuteness and fineness of mind that marks the music of her former teacher, the late, great György Ligeti. The ultra modernist Chin would rather keep our ears in a state of uneasy expectation than seduce them with easy sounds. Yet there's a kind of crazed logic in how she puts those sounds together. The tightly structured anarchy of *Rocaná* held my attention.”⁷⁸

Music allows things to be heard, of course, but can light and color be perceived through music? My aural impression of *Rocaná* after I heard it for the first time in live performance is that the sonic image of colorful light was transmitted to the audience from the instruments.

Rocaná begins with an explosion of light. After the U.S. premiere at Carnegie Hall, *The New York Times* raved: “...the piece is a knockout. It begins with a gnarly, clattering explosion; call it the Little Bang. Then comes a pattern of background harmonies, always simmering, eerily quiet and pervasive. But throughout the work, jolts of energy keep happening: leaping lines, ominous 12-tonish themes that pierce the tranquil background buzz, outbursts of wailing brasses and metallic strings that come at you like a musical flamethrower. The piece might be described as a response to Ives’s *Unanswered Question*.”⁷⁹

The Chicago Tribune added: “...a continuous 20-minute score Chin has crafted as a field of unquiet aural dreams. She is fascinated by the volatility of orchestral sounds

⁷⁸ http://articles.chicagotribune.com/2008-04-26/features/0804250597_1_unsuk-chin-orchestral-kent-nagano

⁷⁹ Anthony Tommasini, “Supercharged Solo Followed by a Cosmic Energy Riot,” Music Review, *The New York Times*, March 10th, 2008.
<http://www.nytimes.com/2008/03/10/arts/music/10naga.html?ref=music&pagewanted=print&r=0>

and how they evolve into other, seemingly unrelated musical events, traveling in waves as light does. Her huge orchestral palette is laced with all manner of percussion, including Japanese temple bells and a xylophone of stones. At times, she employs it as sparingly as a neo-pointillist painter; at other times, violent chords ricochet around the brasses, turning the ensemble into a mechanistic juggernaut.”⁸⁰

Rocaná can be largely divided in two sections: the beginning of light (m.1) and the beginning of dark (from m.287). The big explosion of the first measure in four trumpets, percussion, and strings is the origin of light and this piece. Immediately the spectra of the explosion continue in the string parts, and they lead the light to several additional sub-explosions. Each instrument group clearly plays its own role.

Section I:

mm.1-32	The beginning of light
mm.33-66	String harmonics and half harmonics sul ponti.
mm.67-80	Second explosion
mm.81-98	Wave of light
mm.99-125	Light moves in silence
mm.126-149	Preparation for the next explosion
mm.150-166	Reference to the beginning
mm.167-182	Wave of light
mm.183-212	Light moves in silence
mm.213-224	Emission of individual lights
mm.225-254	Reference to the beginning
mm.255-286	Climax, largest explosion

⁸⁰ http://articles.chicagotribune.com/2008-04-26/features/0804250597_1_unsuk-chin-orchestral-kent-nagano

1. The beginning of light (mm.1-32)

The first G# “flash” in four trumpets, percussion, and strings immediately spreads into a spectrum of light from the second measure through the violins and violas. Chin frequently uses very rapid notes with half-harmonics *sul ponticello* and small intervals, from a minor second to a tritone to make the background sound of light-like reverberations throughout the piece. The violins are divided into seven sections which weave into each spectrum with ascending or descending motives. The spreading light converges towards Bb at m.16; this Bb is reflected inside the room and starts small flashes in the brass and percussion (Bb-B-F-C#) moving toward C# at m.29. The continuous line in the vibraphone, harp, and piano is speckled by single-note unison doublings in the woodwind and brass. The main role of the brass section is to make various light colors.

Example 9: *Rocaná*, mm.1-4

[illegible]

2. String harmonics and half harmonics sul ponti (mm.33-66)

After the first flash, the second section starts almost inaudibly with string harmonics. This dim light (*ppppp*) and the latent embers in the brass lead to an explosion at m.38 which creates a longer spectrum and more flashes. A twelve-tone row (except E) is presented as flashes in *Klangfarbenmelodie*⁸¹ in the winds (doubling percussion and piano), mm.49-51; the notes are vertically accumulated in the strings. The main intervallic structures she frequently used in this piece are major/minor seconds and the tritone.

Example 10: *Rocaná*, mm.33-36

3. Second explosion (mm.67-80)

This bigger explosion (m.67) has more potential colors of light. Although the strings have the same pattern as the first section, the dynamic level is much more active. The length of light in horns, trumpets, and trombones is getting longer, and a distortion of

⁸¹ Melody of tone colors. Term introduced by Schoenberg in *Harmonielehre* (1911) to describe the contrasts in timbre introduced in the third of his 5 *Orchestral Pieces* (1909), and which now constitute a structural element in modern composition comparable in importance with pitch, duration, etc. (The Oxford Dictionary of Music)

4. Wave of light (mm.81-98)

In this section, short repeated notes appear for the first time in the woodwinds, these notes also forming a *Klangfarbenmelodie*. Various waves of each instrumental group come together at m.89 with repeated notes.

5. Light moves in silence (mm.99-125)

Contrary to the previous section, the light is in a more steady state in this section. Horns and trumpets make “breath noise with tones,” trombones play with a metal mute, and only two double bass soli of the strings are used *ppppp*. There are no melodic or harmonic uses of instruments until m.120.

6. Preparation for the next bang (mm.126-149)

The movement of light becomes more active and rhythmic. From m.132, Chin marks different beat combinations in 7/8: 2+2+3, 2+3+2, and 3+2+2. Each brass instrument has different accents, as if flashes of light are popping everywhere in the room. Time signatures change frequently.

7. Reference to the beginning (mm.150-166)

One of the main ideas, an ascending quasi-chromatic line, returns as a reminder of the first section. From m.157, the orchestra group is divided in two: winds with percussion and strings, making an extreme contrast in dynamics, articulation, and rhythm.

8. Wave of light (mm.167-182)

Very thin and calm waves continue in the strings in harmonics.

9. Light moves in silence (mm.183-212)
10. Emission of individual lights (mm.213-224)
11. Reference to the beginning (mm.225-254)
12. Climax, largest explosion (mm.255-286)

Section II:

Beginning of the Darkness

- mm.287-304 Dark room, a dim light from the horns is represented by a minor 6th in mm. 302-303
- mm.305-323 Bright sparkling in woodwinds, percussion, harp, and celesta (canonic motive) moves to a spectrum of augmented chords built on F, A, C#
- mm.324-341 New explosion with Bb and B → continuous A augmented chords' spectra
- mm.342-350 Dark again
- mm.351-382 Short lights begin from everywhere (*Klangfarbenmelodie*), and long melodic lines are added in the alto flute and English horn. The lights accumulate power in preparation for another bang
- mm.382-419 A little bang → sustaining C# → another bang → string harmonics → bang → sustaining B → bang → sustain chords
- mm.420-428 An explosion → different spectra of light are determined by orchestration
- mm.429-437 Repeated notes
- mm.438-462 Distortion of lights move here
- mm.463-474 Climax
- mm.475-500 Accumulating power of light

In this section, orderly structures suddenly become turbulent, while chaotic moments gain form. Likewise, pointillistic structures transform into cloudlike aggregates of sound, and vice versa. These processes are often distinguished by self-similarity, as

stated in the program note in the Boosey and Hawkes website.⁸² The following is part of the program note to *Rocaná* by Maris Gothoni, a pianist and Chin's husband:

This was not a matter of mere illustration, but of their depiction by musical means: "Art as harmony parallel to nature" (Cézanne). Since sound waves – as the physical phenomenon of a bodiless oscillation – are similar to light waves, music seems the appropriate medium for a "translation" of light phenomena. Furthermore, physical phenomena like depth and density, spatial perceptions and illusions of various sorts were important associations in the composition process. Ólafur Elíasson's installations *The Weather Project* and *Notion Motion* provided additional extra-musical inspiration.⁸³

2.4. Yoon K. Park, *Room of Colors* (2012)

I do not have a specific synesthesia, but whenever listening to Chin's music, I am aware of color, whether she intends to convey it or not. Since the inner compositional process of a composer is very subjective, it is hard to determine how the composer produces the sound with chosen colors without a specific color-music chart. Fortunately, the composers from whom I have taken examples often have spoken about or explained their music. In thinking about how I could reflect color in my music, I started research on synesthesia, listened to music that contained a coloristic concept as a compositional method, and tried to find how the composers applied color to their music in their own way.

Before I composed my orchestral piece, *Room of Colors*, I made the following color-music chart, a kind of projection in response to Chin's *Rocaná*.

⁸² <http://www.boosey.com/cr/music/Rocan/49290>

⁸³ Ibid., © Maris Gothoni (translation by Howard Weiner)

Table 5: Color-music chart for *Room of Colors*, by Park

Section	Color	Main Pitch	Harmonic Structure*	Bases of the Melodic Structure	Main Instruments
1: Introduction (mm.1-20)	Red	C	5 th and 4 th	Pentatonic (C, D, E, G, A)	Chimes, Harp, Strings
Transition 1 (mm.21-26)				Atonal	
2 (mm.27-46)	Orange	G	3 rd	Modal	Woodwinds, Strings
3 (mm.47-63)	Yellow	D	2 nd	Whole-tone (D, E, F#, G#, Bb, C)	Horns, Woodwinds
4 (mm.64-85)	Green	A	Unison	Aeolian (A, B, C, D, E, F, G)	Flutes, Marimba, Piano
Transition 2 (mm.85-95)				Atonal	Timpani, Marimba
5 (mm.96-139)	Blue	E	2 nd	Octatonic (E, F#, G, A, Bb, C, Db, Eb)	Horns, Strings
6 (mm.140-166)	Indigo	F# (Gb)	3 rd	Minor mode	Strings
7 (mm.167-189)	Violet	C# (Db)	5 th and 4 th	Chromatic	Brass, Piano
Transition 3 (mm.189-207)					Strings
Coda (mm.208-307)	Mixed				

*Prevailing vertical structures

The color-music chart for *Room of Colors* is based on the circle of fifths, and I designated each section with a different color and different instrumentation. My sense of color is two-dimensional, rather than Chin's three-dimensions. That is, while Chin's "room" is more stereoscopic with light, my "room" is filled with seven different primary melodic lines, each associated with a specific color; these lines sometimes tangle with

one another. The formation of the room begins with C, the base color line, and spreads throughout the room through harmonic and melodic structures.

Section 1 (mm.1-20) – C – Red

Example 12: *Room of Colors*, mm.1-8

The musical score for Example 12, *Room of Colors*, mm.1-8, is presented in 3/4 time with a tempo of approximately 56. The score includes staves for Percussion (Chimes), Harp, Piano (Celesta), Violin I, Violin II, Viola, Violoncello, and Double Bass. The Chimes and Harp play a melodic line starting on C, while the strings provide a harmonic foundation with a narrow curve around C. Dynamics include *pp* (pianissimo) and *p* (piano).

For the beginning of the initial color, red, and its associated central pitch of C, a musical line is introduced cautiously in chimes and harp. This line gradually forms embers with strings leading to an explosion in the next section. The C lines in the strings move slightly up and down in a narrow curve around C while chimes and harp continue the ostinato. A transition is initiated by the entrance of the clarinets at m.19 and continued by the flutes, bassoons, and strings moving toward the G line in Section 2.

Transition 1 (mm.21-26)

Example 13: *Room of Colors*, mm.21-26

A
♩ = ca. 72

Fl. 1.2
Fl. 3
Ob. 1.2
Eng. Hn.
Cl. 1.2 in Bb
B. Cl. in Bb
Bsn. 1.2
Cbsn.

Section 2 (mm.27-46) – G – Orange

The first explosion with G lines appears mainly in the strings doubled by the woodwinds. Unlike the C line, the G lines move around in a broader range, actively producing new harmonic structures.

Example 14: *Room of Colors*, mm.27-32

Vln. I
Vln. II
Vla.
Vc.
Db.

Section 3 (mm.47-63) – D – Yellow

The first and the third horns, doubled in the cellos, begin the main D line with free counterpoint in the English horn and the bassoon. This section produces more chromatic activity than the previous section. The density of this section is increased by additional free counterpoints between the flute and the bassoon lines from m.52.

Example 15: *Room of Colors*, mm.47-52

B
Con moto ♩ = ca. 80

Fl. 1.2
Ob. 1.2
Eng. Hn.
Cl. 1.2 in Bb
Bsn. 1.2
Hn. in F 1.2, 3., 3.4

mp, *mf*, *p*, *mp*

50

Section 4 (mm.64-85) – A – Green

The green color initially begins with the flute unison in a contrapuntal relationship with the clarinets and the horns, but the main melodic line is switched right away with the entrance of the marimba and piano at m.65. The two keyboard instruments take over the main melody from G#, the leading tone of A, and surround the main note, diffusing the beams of green light until they meet in tutti for the first time at m.71. The tutti is placed in the middle of the green color, which is the middle color of the rainbow.

After the tutti, the piano comes in with the main line from m.76. The role of the piano is to emphasize the green line, supported by the English horn and the clarinets.

Transition 2 (mm.85-95)

This second transition is mostly for the marimba and timpani duo; it does not imply any specific color, but is the most powerful transition, foreshadowing the textural change that follows. Proportionally, it is not exactly in the middle, but in terms of the structure based on the seven colors, this ten-measure transition plays the role of a bridge between the first and second halves of the piece.

Example 17: *Room of Colors*, mm.85-88

The musical score for Example 17, *Room of Colors*, measures 85-88, features two staves: Timpani (Timp.) and Marimba/Percussion 3 (Perc. 3). The Timpani staff begins with a 6-measure rest, followed by a 5-measure rest, and then a 3-measure rest. The Marimba staff begins with a 6-measure rest, followed by a 5-measure rest, and then a 3-measure rest. The score includes dynamic markings of *mf* and *f*, and a key signature change from D major to A minor.

Section 5 (mm.96-139) – E – Blue

The blue color E is the highest open string of the violin and the lowest open string of the double bass at the same time. Therefore, the open-string pizzicatos of the string instruments become the base color of this section. Frequent changes of meter represent the waves of the deep blue sea, and four dark-blue dolphins are playing with the waves in the horn part.

Example 18: *Room of Colors*, mm.108-115

The musical score for Example 18, *Room of Colors*, measures 108-115, is presented for a full orchestra. The score includes parts for Horns in F (1.2 and 3.4), Trumpets 1 & 2 in C (a2 con sord.), Trombones 1 & 2, Timpani, Percussion 1 (B.D.), Percussion 2 (Wood Blocks), Violins I & II, Viola, Violoncello, and Double Bass. The score shows measures 110 and 115 circled. The music features a complex texture with various articulations like gliss., pizz., arco (col legno), and dynamic markings like ff and f.

The blue color accumulates its texture by adding more instruments that have different timbres and leads to the climax at m.140, which is a starting point of Indigo.

Section 6 (mm.140-166) – F# - Indigo

To me, indigo is the darkest color among the seven-color spectrum. Furthermore, it is for me the trustiest color. I wanted to express the color in the strongest way possible and make it a climatic point. I assigned all the strings to describe the hidden power of the color. It is not rushing but proceeds firmly step by step in the strings.

Example 19: *Room of Colors*, mm.140-147

F
 Andante (♩ = ca. 72)
 Vln. I *ff*
 Vln. II *ff*
 Vla. *ff*
 Vc. *ff*
 Db

Section 7 (mm.167-189) – C# - Violet

This section is capricious in dynamics, rhythm, articulation, and expression. The first two measures of clusters go forward as the main center, radiating small beams in all directions. The small lights twinkle with 16th-note staccatos like stars, mostly in the upper woodwinds, for 21 measures (mm.169-189), tossed among instruments and incessantly twinkling until entering the third transition.

In this section, all seven colors warm up for mixture in the coda.

All previously represented colors reappear in the coda. These second statements of each color sound in various ways: distorted, reflected, curved, and sometimes with direct shapes. This longest section (100 measures) finally leads back to the first color, Red, and concludes with a big explosion of that origin color.

Example 21: *Room of Colors*, mm.300-307

300

305

Fl. 1, 2

Fl. 3

Ob. 1, 2

Eng. Hn.

Cl. 1, 2
in Bb

B. Cl.
in Bb

Bsn. 1, 2

Cbsn.

Hn. in F
1, 2
3, 4

Tpt. 1, 2
in C

Tpt. 3
in C

Tbn. 1, 2

B. Tbn.
Tuba

Timp.

Perc. 1
Cym.

Perc. 2

Perc. 3
Chimes

Hp.

Pno.

Vln. I

Vln. II

Vla.

Vc.

Db.

CHAPTER 3: CONCLUSION

“The color *underlines* the tonality,” Scriabin told the British psychologist Charles Myers in 1915, “it makes the tonality more evident.”⁸⁴ Even though there are various music examples related to color, pieces written by composers with true synesthesia are rare. Most of the examples are regarded as artistic metaphor using color as part of the compositional process. However, since the realizations of synesthesia are very subjective, composers involving color in their music tend to apply their own unique methods.

Alexander Scriabin simply used a “clavier à lumières” in *Prometheus: The Poem of Fire, Op. 60* (1910) to present his color-music correspondence. Based on Cytowic’s criteria, his colored hearing was more artificial and more carefully worked-out; nonetheless, Scriabin’s attempt took the lead at that time in terms of mapping colors in actual performance, and Scriabin is still considered the pioneer of light-music art. By contrast, Olivier Messiaen realized his idiopathic synesthetic relation of color to music by demonstrating the color chords based on his modes of limited transposition in *Couleurs de la cité céleste* (Colors of the Celestial City, 1963); yet this too was a planned construct in that he used a system of color chords he had already established. Unsuk Chin expressed the characters of light in *Rocaná* (Room of Light, 2008) for large orchestra by combining, juxtaposing and separating the different sound effects of each instrumental group. My orchestral piece, *Room of Colors* is in part a response to Chin’s *Rocaná*. The color-music chart for *Room of Colors* is based on the circle of fifths, and each section is

⁸⁴ Charles Myers, “Two Cases of Synaesthesia,” *British Journal of Psychology*, Vol. 7, Issue 1 (May 1914), 113.

designed with a different color and different instrumentation. My room is filled with seven different primary melodic lines, each associated with a specific color.

That is, Scriabin focused more on the note-color relationship, while Messiaen's color association is rather with the chords from his modes of limited transposition. In *Prometheus*, the colors change following the root of each mystic chord, but *Couleurs de la cité céleste* is filled with a group of color chords. On the other hand, Chin's reflection of light on *Rocaná* moves into yet another musical dimension, where the musical association of color and light is grounded in orchestral timbre.

This paper has discussed the varied ways in which composers, synesthetes or non-synesthetes have attempted to establish relationships between color and sound in such a way as to create a musical structure based on either or both aspects simultaneously. The perception of both of these aspects clearly is dependent upon both the composer's and the listener's imagination. Each of the examples cited in this paper describes a very different treatment of the integration of color and sound.

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Appendix: Selected Musical Works Inspired by Visual Arts
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Boulez, Pierre. Structures Ia for two pianos. 1952. Mainz: Universal Edition, 1955.

Art: Paul Klee: Structures Ia

Dutilleux, Henri. Timbres, espace, mouvement for orchestra. Paris: Huegel et Cie, 1980.

Art: Vincent van Gogh: The Starry Night

Henze, Hans Werner. Das Floss der Medusa, oratorio vulgare e militare. 1966. Mainz: Edition Schott, 1967.

Art: Jean Louis Andre Theodore Gericault: Das Floss der Medussa

Higdon, Jennifer. Short Stories for saxophone quartet: one movement titled "Splashing the Canvas." Philadelphia: Lawdon Press, 1996.

Art: Style of Jackson Pollock

Hindemith, Paul. Mathis der Maler, opera and symphony. Mainz: B. Schott's Söhne, 1935.

Art: Matthias Grünewald: Altarpiece at Isenheim, symphony uses three instrumental movements from the opera based on Englekonzert (Angel's concert), Grablegung (Burial), Versuchung des Heiligen Antonius (Temptation of St. Anthony)

Liszt, Franz. Hunnenschlacht for orchestra. Wiesbaden: Breitkopf and Härtel, 1857.

Art: Wilhelm von Kaulbach: Hunnenschlacht

Liszt, Franz. Totentanz for piano and orchestra. Wiesbaden: Breitkopf and Härtel, 1849, rev. 1859.

Art: Orcagna: Il trionfo della morte

Liszt, Franz. Von der Wiege bis zum Grabe for orchestra. New York: G. Schirmer, 1881-2.

Art: Count Michael Zichy: Von der Wiege bis zum Grabe

Rachmaninoff, Sergei. Isle of the Dead, Op. 29, for orchestra. New York: Boosey and Hawkes, Inc., 1907.

Art: Arnold Böcklin: Isle of the Dead

Respighi, Ottorino. Trittico Botticelliano for orchestra. Milan: G. Ricordi and Co., 1927.

Art: Alesandro Di Mariano Botticelli: La Primavera, L'Adorazione dei Magi, La Nascita di Venere

Schuller, Gunther. American Triptych for orchestra. New York: Associated Music Publishers, Inc., 1965.

Art: Alexander Calder: mobile; Jackson Pollack: Out of the Web

Schuller, Gunther. Seven Studies on Themes of Paul Klee for orchestra. Mainz: Universal Edition, 1959.

Art: Paul Klee: Antique Harmonies, Abstract Trio, Little Blue Devil, The Twittering Machine, Arab Village, An Eerie Moment, Pastourale

Sondheim, Stephen. Sunday in the Park with George, musical theatre. 1984. New York: PAJ Publications, 1986.

Art: Georges Pierre Seurat: Sunday on the Island of La Grand Jatte

Stravinsky, Igor. The Rake's Progress, opera. New York: Boosey and Hawkes, Inc., 1951.

Art: William Hogarth: The Rake's Progress series of engravings

Vaughn Williams, Ralph. Job, a masque for dancing. 1927-31.

Art: William Blake: engravings for The Book of Job (1926)

***Room of Colors* for Orchestra (2012/14)**

Yoon Kyung Park

INSTRUMENTATION

3 Flutes (3rd doubling Piccolo)
 2 Oboes
 1 English Horn
 2 Clarinets in Bb
 1 Bass Clarinet in Bb
 2 Bassoons
 1 Contra Bassoon
 4 Horns in F
 3 Trumpets in C
 2 Tenor Trombones
 1 Bass Trombone
 1 Tuba

3 Timpani

Percussion: 3 Players

Bass Drum, Suspended Cymbals, Tambourine
 Snare Drum, 6 Tomtoms, Triangle, Wood Blocks
 Chimes, Marimba

Harp
 Piano

Strings:

Violin I	16
Violin II	14
Viola	12
Violoncello	10
Double Bass	8

* The score is written in C.

(Chimes)

10

15

Perc. 3

Hrp.

Pno.

Vln. I

Vln. II

Vla.

Vc.

Db.

p

fp

p

fp

p

fp

p

fp

CL1.2
in Bb

20

a2

mf

Timp.

p

(Chimes)

p

Hp.

Pno.

Vln. I

mf *f* *sub.p* *fp* *f* *fp*

Vln. II

mf *f* *sub.p* *fp* *f* *fp*

Vla.

mf *f* *sub.p* *fp* *f* *fp*

Vc.

mf *f* *sub.p* *fp* *f* *fp*

Db.

mf *f* *sub.p* *fp* *f* *fp*

unis.

A
♩ = ca. 72

Fl.1.2
Ob.1.2
Cl.1.2 in Bb
Bsn.1.2
Timp.
Perc.3
Vln. I
Vln. II
Vla.
Vc.
Db.

25

mp *mf* *p*

30

Fl.1.2
Ob.1.2
Cl.1.2 in Bb
Bsn.1.2
Timp.
Perc.3
Vln. I
Vln. II
Vla.
Vc.
Db.

f *mf*

Fl. 1.2 *mp* *f*

Ob. 1.2 *mp* *f*

Cl. 1.2 in Bb *mp* *f*

Bsn. 1.2 *mp* *f*

Timp. *f*

Perc. 3

Vln. I *mp* *f*

Vln. II *mp* *f*

Vla. *mp* *f*

Vc. *mp* *f*

Db. *mp* *f*

35



Fl. 1.2 *mp* *p*

Ob. 1.2 *mp* *p*

Cl. 1.2 in Bb *mp* *p*

Bsn. 1.2 *mp* *p*

Perc. 3

Vln. I *mp* *p*

Vln. II *mp* *p*

Vla. *mp* *p*

Vc. *mp* *p*

Db. *mp* *p*

40 rit.

B
Con moto ♩ = ca. 80

(50)

Fl.1.2
Ob.1.2
Eng. Hn.
Cl.1.2 in Bb
Bsn.1.2
Hn. in F
3.4
Perc.3
Vln. I
Vln. II
Vla.
Vc.
Db.

mp *mf* *p* *mf* *p* *mp*

(55)

Fl.1.2
Ob.1.2
Eng. Hn.
Cl.1.2 in Bb
Bsn.1.2
Hn. in F
3.4
Perc.3
Vln. I
Vln. II
Vla.
Vc.
Db.

mf *mp* *mf* *mp* *mf* *mp* *mf*

1. *f* *ff*

Fl.1.2

Ob.1.2

CL.1.2 in Bb

B. CL in Bb

Bsn.1.2

Tpt.1.2 in C

Perc.3

Vln. I

Vln. II

Vla.

Vc.

Db.

f *ff*

C *mf* *mp*

Fl.1.2

Ob.1.2

CL.1.2 in Bb

Bsn.1.2

Hn. in F

Tpt.1.2 in C

Perc.3

Marimba

Pno.

Vln. I

Vln. II

Vla.

Vc.

Db.

mp

70

Fl. 1, 2

Ob. 1, 2

Eng. Hn.

Cl. 1, 2 in Bb

Bsn. 1, 2

Hn. in F

3, 4

Trpt. 1, 2 in C

Tbn. 1, 2

Timp.

(Marimba)

Perc. 3

Hp.

Pno.

Vln. I

Vln. II

Vla.

Vcl.

Db.

73

FL1.2 *ff*

Ob.1.2 *ff*

Eng. Hn. *mp*

CL1.2 in Bb *mp*

Bsn.1.2

Hn. in F *f* *p*

3.4 *mp*

Tpt.1.2 in C *con sord.* *mp* *ff* *ffp* *ff*

Tbn.1.2 *f* *ff*

Timp. *mp* *f*

Perc.3

Harp. *f* *ff*

Piano. *mp*

Vln. I *ffp*

Vln. II *ffp*

Vla. *ff*

Vc. *ffp*

Db. *ffp*

A B C D E F# G

80

Fl.1.2 *mf*

Ob.1.2 *mf*

Eng. Hn.

Cl.1.2 in Bb *mf*

Bsn.1.2 *mf*

Hn. in F *mp*

3.4 *mp*

Tpt.1.2 in C

Tbn.1.2

Timp.

Perc.1

Perc.2

Perc.3

Hp.

Pno.

Vln. I

Vln. II

Vla.

Ve.

Db.

[illegible]

90

Fl.1.2

Ob.1.2

Cl.1.2 in Bb

Bsn.1.2

Hn. in F 1.2

3.4

Trp.

Perc.2

Marimba

Vln. I

Vln. II

Vla.

Vcl.

Db.

Tomtoms

105

Fl.1.2

Ob.1.2

Cl.1.2 in Bb

Bsn.1.2

1.2 *a2 gliss.*

Hn. in F *f*

3.4 *a2 gliss.*

Tpt.1.2 in C *f*

Tbn.1.2

Timp.

Perc.1 Bass Drum *mf*

(Toms)

Perc.2

Vln. I *pizz.* *arco (col legno)*

Vln. II *pizz.* *arco (col legno)*

Vla. *pizz.* *arco (col legno)*

Vc. *pizz.* *arco (col legno)*

Db. *pizz.* *arco (col legno)*

110

115

1.2 *gliss.*

Hn. in F *gliss.*

3.4 *a2 con sord.* *ff*

Tpt.1.2 in C

Tbn.1.2

Timp.

(B. D.)

Perc.1

Perc.2 Wood Blocks *f*

Vln. I *pizz.* *arco (col legno)*

Vln. II *pizz.* *arco (col legno)*

Vla. *pizz.* *arco (col legno)*

Vc. *pizz.* *arco (col legno)*

Db. *pizz.* *arco (col legno)*

120

Fl.1.2

Fl.3

Ob.1.2

Eng. Hn.

Cl.1.2 in Bb

Bsn.1.2

Hn. in F

3.4

Tpt.1.2 in C

Tpt. 3 in C

Tbn.1.2

B. Tbn. Tuba

Timp.

Perc.1

Perc.2

Perc.3

Pno.

Vln. I

Vln. II

Vla.

Vc.

Db.

f

ff

gliss.

f

gliss.

f

f

mf

Bass Drum

pizz.

arco (col legno)

pizz.

arco (col legno)

pizz.

arco (col legno)

pizz.

arco (col legno)

pizz.

arco (col legno)

Picc. (125)

Fl.1.2 *ff*

Fl.3 *ff*

Ob.1.2 *ff*

Eng. Hn. *ff*

Cl.1.2 in Bb *ff*

Ban.1.2 *ff*

Hn. in F *gliss.*

3.4 *gliss.*

Tpt.1.2 in C *con sord. ff*

Tpt. 3 in C

Tbn.1.2 *gliss.*

B. Tbn. Tuba *f*

Timp.

Perc.1 (B. D.)

Perc.2 Wood Blocks *f*

Perc.3

Pno.

Vln. I *pizz. sf* *arco (col legno)* *pizz. sf* *arco (col legno)*

Vln. II *pizz. sf* *arco (col legno)* *pizz. sf* *arco (col legno)*

Vla. *pizz. sf* *arco (col legno)* *pizz. sf* *arco (col legno)*

Ve. *pizz. sf* *arco (col legno)* *pizz. sf* *arco (col legno)*

Db. *pizz. sf* *arco (col legno)* *pizz. sf* *arco (col legno)*

130 Picc.

Fl.1.2

Fl.3

Ob.1.2

Eng. Hn.

Cl.1.2 in Bb

Bsn.1.2

Hn. in F

3.4

Tpt.1.2 in C

Tpt.3 in C

Tbn.1.2

B. Tbn. Tuba

Timp.

Perc.1

Perc.2

Perc.3

Pno.

Vln. I

Vln. II

Vla.

Vcl.

Db.

135

rit.

ff

f

senza sord.

quasi-gliss.

Hard sticks

Triangle

Snare Drum

pizz.

arco, ord.

rit.

F
Andante (♩ = ca. 72)

140

Fl.1.2
Fl.3
Ob.1.2
Eng. Hn.
Cl.1.2
in Bb
Bsn.1.2
1.2
Hn. in F
3.4
Tpt.1.2
in C
Tpt. 3
in C
Tbn.1.2
B. Tbn.
Tuba
Timp.
Perc.1
Perc.2
Perc.3
Pno.

F
Andante (♩ = ca. 72)

Vln. I
Vln. II
Vla.
Vc.
Db.

150 155

Timp.

Perc. 1

Perc. 2

Perc. 3 (Marimba) *ff*

Pno.

Vln. I

Vln. II

Vla.

Vc.

Db.



160

Timp.

Perc. 1

Perc. 2

Perc. 3 (Marimba)

Pno.

Vln. I

Vln. II

Vla.

Vc.

Db.

170

Fl.1,2

Ob.1,2

Eng. Hn.

Cl.1,2 in Bb

Bsn.1,2

1,2 Hn. in F

3,4

Tpt.1,2 in C

Tpt. 3 in C

Tbn.1,2

B. Tbn. Tuba

Temp.

Perc.1

Perc.2

Perc.3

Pno

Vln. I

Vln. II

Vla.

Vc.

Db.

175

180

Fl. 1, 2

Ob. 1, 2

Clar. in Bb

Bsn. 1, 2

Hn. in F

3, 4

Timp.

Pno.

Vln. I

Vln. II

Vla.

Vcl.

Db.

1.

mp

f

pizz.

arco

subp

1.

183

Fl. 1.2

Ob. 1.2

Cl. 1.2 in Bb

Bsn. 1.2

1.2

Hn. in F

3.4

Timp.

Pno.

Vln. I

Vln. II

Vla.

Vcl.

Db.

arco

subp

pizz.

mf

f

p

FL1.2
Ob.1.2
Cl1.2 in Bb
Bsn.1.2
1.2
Hn. in F
3.4
Timp.

H
190

Vln. I
Vln. II
Vla.
Vc.
Db.

ff
ff
ff
ff
ff
espress.
ff
espress.

FL1.2
Ob.1.2
Cl1.2 in Bb
Bsn.1.2
1.2
Hn. in F
3.4
Timp.

195

Vln. I
Vln. II
Vla.
Vc.
Db.

arco
ff
ff
ff
ff

Vln. I
Vln. II
Vla.
Vc.
Db.

200

arco
ff
ff
ff
ff

I
Molto Allegro $\text{♩} = \text{ca. } 126$ **(210)**

Picc. ♩ tr

205

Fl. 1.2

Fl. 3

Ob. 1.2

Eng. Hn.

Cl. 1.2 in Bb

B. Cl. in Bb

Bsn. 1.2

Cbsn.

Hn. in F

3.4

Tpt. 1.2 in C

Tpt. 3 in C

Tbn. 1.2

B. Tbn. Tuba

Temp. (Medium sticks)

B. D.

Perc. 1

Perc. 2

Perc. 3

I
Molto Allegro $\text{♩} = \text{ca. } 126$

Vln. I

Vln. II

Vla.

Vc.

Div. a2 col legno

Db.

p

215

220

Fl.1.2

Fl.3

Ob.1.2

Eng. Hn.

Cl.1.2 in Bb

B. Cl. in Bb

Bsn.1.2

Cbsn.

1.2

Hn. in F

3.4

Tpt.1.2 in C

1. sord.

2. sord.

Tpt. 3 in C

Tbn.1.2

B. Tbn. Tuba

Timp.

Perc.1

Snare Drum

Wood Blocks

Perc.2

Perc.3

Vln. I

Vln. II

Vla.

Vcl.

Db.

This is a page from a musical score, likely for a symphony, featuring multiple staves for various instruments. The page includes a rehearsal mark (225) and dynamic markings such as *p*, *mp*, and *arco*.

The instruments listed on the left side of the score are:

- Fl. 1.2
- Fl. 3
- Ob. 1.2
- Eng. Hn.
- Cl. 1.2 in Bb
- B. Cl. in Bb
- Bsn. 1.2
- Cbsn.
- Hn. in F (1.2 and 3.4)
- Tpt. 1.2 in C
- Tpt. 3 in C
- Tbn. 1.2
- B. Tbn. Tuba
- Timp.
- Perc. 1
- Perc. 2
- Perc. 3
- Vln. I
- Vln. II
- Vla.
- Vc.
- Db.

The score includes various musical notations, including notes, rests, and dynamic markings. A rehearsal mark (225) is present in the upper right section. The page is numbered 225 in the top right corner.

230

Fl. 1, 2

Fl. 1, 2

Fl. 3

Ob. 1, 2

Eng. Hn.

Cl. 1, 2 in Bb

B. Cl. in Bb

Bsn. 1, 2

Cbsn.

1, 2

Hn. in F

3, 4

Tpt. 1, 2 in C

Tpt. 3 in C

Tbn. 1, 2

B. Tbn. Tuba

Timp.

Perc. 1

(S. D)

Perc. 2

Perc. 3

Vln. I

Vln. II

Vla.

Vc.

Db.

235

(sord.)

mp

a 2. con sord.

mp

Tambourine

mp

Triangle

mp

solo

mp

tutti, div. a2

mp

solo

mp

tutti, div. a2

mp

pizz.

mp

mp

mp

mp

The image shows a page of a musical score, likely for a symphony, featuring staves for various instruments. The score is written in a standard musical notation style, including notes, rests, and dynamic markings.

Instrument Staves (from top to bottom):

- Fl. 1.2
- Fl. 3
- Ob. 1.2
- Eng. Hn.
- Cl. 1.2 in Bb
- B. Cl. in Bb
- Bsn. 1.2
- Cbsn.
- Hn. in F
- 3.4
- Tpt. 1.2 in C
- Tpt. 3 in C
- Tbn. 1.2
- B. Tbn. Tuba
- Timp.
- Perc. 1
- Perc. 2
- Perc. 3
- Vln. I
- Vln. II
- Vla.
- Vcl.
- Db.

Key Musical Elements and Markings:

- Measure 240:** A circled measure number at the top center.
- Picc.:** Piccolo, indicated above the first Flute staff.
- Dynamics:** *mf* (mezzo-forte), *f* (forte), and *p* (piano) are used throughout the score.
- Trills:** Indicated by "tr" above notes in several staves.
- Performance Instructions:**
 - senza sord.* (without mutes) for Trombone 1.2.
 - arco, col legno* (arco, with the wood of the bow) for Viola, Violoncello, and Double Bass.
 - open* for Horn 3.4.

243

Picc.

250

Fl. 1.2

Fl. 3

Ob. 1.2

Eng. Hn.

Cl. 1.2 in Bb

B. Cl. in Bb

Bsn. 1.2

Cbn.

Hn. in F

3.4

Tpt. 1.2 in C

Tpt. 3 in C

Tbn. 1.2

B. Tbn. Tuba

Timp.

Bass Drum

Perc. 1

Perc. 2

Perc. 3

Marimba

Vln. I

col legno

Vln. II

col legno

Vla.

Vc.

Db.

253

Picc.

Fl. 1.2

Fl. 1.2

Fl. 3

Ob. 1.2

Eng. Hn.

Cl. 1.2 in Bb

B. Cl. in Bb

Bsn. 1.2

Cbsn.

1.2

Hn. in F

3.4

Tpt. 1.2 in C

Tpt. 3 in C

Tbn. 1.2

B. Tbn. Tuba

Timp.

Perc. 1

Perc. 2

(Marimba)

Perc. 3

Vln. I

Vln. II

Vla.

Vc.

Db.

The musical score for page 93, measures 253-258, features a variety of instruments. The woodwinds (Piccolo, Flutes 1.2 and 3, Oboe 1.2, English Horn, Clarinets 1.2 in Bb, Bass Clarinet in Bb, Bassoon 1.2, and Contrabassoon) and brasses (Horn 1.2 in F, Horn 3.4, Trumpets 1.2 in C and 3 in C, Trombones 1.2, and Bass Trombone/Tuba) are mostly silent, with some Piccolo and Bassoon 1.2 activity in measures 253 and 258. The percussion section includes Timpani (measures 253-258), Percussion 1 and 2 (silent), and Percussion 3 (Marimba, measures 253-258). The strings (Violins I and II, Viola, Violoncello, and Double Bass) provide a harmonic foundation with sustained notes and some movement in measures 253 and 258.

260

FL1.2

FL3

Ob.1.2

Eng. Hn.

Cl1.2 in Bb

B. Cl. in Bb

Bsn.1.2

Cbn.

1.2

Hn. in F

3.4

Tpt.1.2 in C

Tpt. 3 in C

Tbn.1.2

B. Tbn. Tuba

Timp.

Perc.1

Perc.2

Perc.3 (Marimba)

Vln. I

Vln. II

Vla.

Vc.

Db.

Tomtom

f

5

5

265

Pico.

FL1.2

FL3

Ob.1.2

Eng. Hn.

CL1.2 in Bb

B. CL in Bb

Bsn.1.2

Cbsn.

1.2

Hn. in F

3.4

Tpt.1.2 in C

Tpt. 3 in C

Tbn.1.2

B. Tbn. Tuba

Timp

Perc.1

(Toms)

Perc.2

Marimba

Perc.3

Vln. I

Vln. II

Vla.

Vc.

Db.

270

Detailed description: This page of a musical score covers measures 265 to 270. The instrumentation includes woodwinds (Flutes 1 & 2, Flute 3, Oboe 1 & 2, English Horn, Clarinets 1 & 2 in Bb, Bass Clarinet in Bb, Bassoons 1 & 2, Contrabassoon), brass (Horn 1 & 2 in F, Horns 3 & 4, Trumpets 1 & 2 in C, Trumpet 3 in C, Trombones 1 & 2, Baritone Trombone/Tuba), percussion (Tympani, Percussion 1, Percussion 2 (Toms), Percussion 3 (Marimba)), and strings (Violins I & II, Viola, Violoncello, Double Bass). The score is written in 4/4 time. Measure 265 features a Piccolo entry with a trill. Measures 266-269 show various woodwind and brass entries and sustained notes. Measure 270 features a complex rhythmic pattern in the percussion section, including triplets and quintuplets, and a dense string texture with many sixteenth notes.

J
Meno mosso ($\text{♩} = \text{ca. } 96$)

Picc.

275

Fl.1.2

Fl.1.2 *ff*

Fl.3 *ff*

Ob.1.2 *ff*

Eng. Hn. *ff*

Cl.1.2 in Bb *ff*

B. Cl. in Bb *ff*

Bsn.1.2 *ff*

Cbn. *f*

Hn. in F *ff*

3.4 *ff*

Tpt.1.2 in C *ff*

Tpt.3 in C *ff*

Tbn.1.2 *ff*

B. Tbn. Tuba *ff*

Timp. *ff*

Perc.1

Perc.2

Perc.3 *ff*
Marimba

J
Meno mosso ($\text{♩} = \text{ca. } 96$)

Vln. I *ff*

Vln. II *ff*

Vla. *ff*

Vc. *ff*

Db. *ff*

[illegible]

290

Fl. 1.2
Fl. 3
Ob. 1.2
Eng. Hn.
Cl. 1.2 in Bb
B. Cl. in Bb
Bsn. 1.2
Cbsn.

1.2 Hn. in F
3.4
Tpt. 1.2 in C
Tpt. 3 in C
Tbn. 1.2
B. Tbn. Tuba
Timp.

Perc. 1
Perc. 2
Perc. 3

Vln. I
Vln. II
Vla.
Vc.
Db.

Detailed description: This page of a musical score covers measures 290 through 297. The woodwind section (Flutes 1.2 and 3, Oboe 1.2, English Horn, Clarinets 1.2 in Bb and Bass Clarinet in Bb, Bassoon 1.2, and Contrabassoon) is mostly silent, with rests throughout. The brass section (Horn in F 1.2 and 3.4, Trumpets 1.2 in C and 3 in C, Trombone 1.2, Baritone Trombone/Tuba, and Timpani) plays melodic lines with various articulations like accents and slurs. The percussion section (Percussion 1, 2, and 3) provides rhythmic support with chords and patterns. The string section (Violins I and II, Viola, Violoncello, and Double Bass) plays sustained harmonic lines with many notes marked with accents.

295

Fl.1.2 *mp* *mf* *f*

Fl.1.3

Ob.1.2 *f*

Eng. Hn.

CL.1.2 in Bb *mp* *f*

B. CL. in Bb

Bsn.1.2 *mp* *f*

Cbsn.

Hn. 1.2

Hn. 3.4

Tpt.1.2 in C

Tpt. 3 in C

Tbn.1.2

B. Tbn. Tuba *mf*

Timp. *mp*

Perc.1

Perc.2

Perc.3

Hp.

Pno.

Vln. I *mp* *mf* *f*

Vln. II *mp* *f*

Vla. *mp* *f*

Ve. *mp* *f*

Db. *mp* *mf*

[illegible]