

Quantum Dances (2010)

for clarinet, violin, and piano


Robert Carl

Written for and dedicated to the Anatolian Trio:

*Erberk Eryilmaz, piano
Anna Griffis, violin
Dan Liptak, clarinet in Bb*

Duration: c.13.5'

Notation: Trills are always a half step above the indicated note

The symbol  indicates that the player should move from a normal vibrato to one that is slow and wide at the peak of the line, and returns to normal at the end of the descent (unless senza vibrato is indicated)

Note:

Quantum Dances is a fanciful representation of the behavior of subatomic particles. I certainly do not pretend to understand quantum mechanics; I just enjoy reading books about contemporary physics written for laypeople. Whenever I stumble upon a concept or behavior that intrigues or amuses me, I start to think about musical analogues. What engages me is the fact that these natural phenomena may actually suggest musical processes I might never have otherwise imagined.

The work is a suite of eleven short dances. The title of each describes the scientific source. It may be performed in two different manners:

- 1) The work is played as written by the three players, with no commentary.*
- 2) A narrator announces the title of each dance before it is played, a bit like Carnival of the Animals.*

As I've finished the piece, I realize there are two composers haunting it. Bartok is one, particularly evident to me as I've been working carefully through the Mikrokosmos for the past three years (and am almost done!). The other is Tom Johnson, whom I finally met September last, and whose "algorithmic minimalism" I found exciting in both its fantasy and rigor.

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1. The trace of the Big Bang is low-level microwave radiation

(♩ = 76)

Cl. in B \flat

mf *mp*

(Clarinet and Violin not too loud, but emerging from piano chord with nervous energy, and then progressively dissipating)
(con sord.)

Violin

f

Piano

fff

Ped. (sempre laisser vibrer)

Cl.

p *mp* *p*

Vln.

mf *mp*

Pn.

ff *f*

2

Cl. *pp p pp ppp*

Vln. *p pp ppp*

Pn. *mf p pp*

4 *mp*

8va *8vb*

2. Electrons not only have independent orbits, but they have two types of spin.

Cl. *pppp mp cresc. mf mp*

Vln. *pppp p cresc. (separate bows throughout)*

Pn. *ppp p ppp*

7 *(catch resonance)* *(U.C.)*

(= 148) *(senza sord.)* *3 (3 simile)*

Cl. *cresc.* ----- *mf* *mp*

Vln. *mp* -----

Pn. *(secco!)* *p* *mp* *sf* *p*

10 * *8va*

Cl. *cresc.* -----

Vln. *mf* *mp* *cresc.* -----

Pn. *mp* *sf* *ppp*

12 *Red.* * *(U.C.)* *8va*

Cl. *mf*

Vln. *mf* *f*

Pn. *p* *mp* *sf*

14 * *8va* *

Cl. *f* *mp* *cresc.*

Vln. *mp* *cresc.* *mf*

Pn. *mp* *mf* *sf* *ppp*

16 *8va* * (U.C.)

Cl. *mf* ----- *f* ----- *mf*

Vln. ----- *f*

Pn. *mp* ----- *mf* ----- *sf*

18 *8va* ----- *Ped.* *

Cl. ----- *mp* ----- *p*

Vln. *sf* ----- *mp* ----- *p*

Pn. *p* ----- *mf* ----- *sf* ----- *p* ----- *mp*

20 *8va* ----- *(No Pedal!)*

(♩ = 72) 3. *Photons and their antiparticles have no charge, and hence are the same.*

Cl. *p*

Vln. *p*
(con sord; sempre pizz.)

Pn. *p*
(U.C. sempre)

Cl.

Vln.

Pn.

Cl. $\frac{9}{16}$ $\frac{3}{16}$ $\frac{4}{16}$

Vln. $\frac{9}{16}$ $\frac{3}{16}$ $\frac{4}{16}$

Pn. $\frac{9}{16}$ $\frac{3}{16}$ $\frac{4}{16}$

33

Cl. $\frac{13}{16}$

Vln. $\frac{13}{16}$ (*senza sord.*)

Pn. $\frac{13}{16}$

39

Cl. *mp*

Vln. *mp*

Pn. *mp*

43

Cl. *mf* *f*

Vln. *mf* *f*

Pn. *mf* *f*

45

(♩ = 52)

Cl. *ff* *pp*

Vln. *pp* (con sord.)

Pn. *ff* *pp*

47

4. Cold dark matter, denser and heavier than visible matter.

Cl. *pp* (senza vibrato) *n.*

Vln. *pp* Sul G (senza vibrato) *n.*

Pn. *ppp* (2-note chromatic clusters) (L.V.)

51

ped. (sempre)
(U.C.)

Cl. *p* *n.*

Vln. *p* *n.* Sul D

Pn. (3-note chromatic clusters)

53

Cl. *mp* *mf* *mp* *n.*

Vln. *mp* *mf* *mp* *n.* Sul G Sul D

Pn. (4-note chromatic clusters)

55

Cl. *mp* *decresc.* *p > n.* *mp*

Vln. *Sul G* *mp* *decresc.* *p > n.* *mp*

Pn. (5-note chromatic clusters)

57

Cl. *p > n.*

Vln. *p* *n.*

Pn.

60

5. *As one gets to ever smaller distances,
particles become vibrating strings.*

(♩ = 108)

Cl. *f* *mf*

Vln. (*senza sord.*) *f* *mf*

Pn. *sf* *f*

66 * (both pedals) *sf*

Cl. *mp* *p* *tr* (all trills are up a half step)

Vln. *mp*

Pn.

73

Cl. *pp* *pp* *mp*

Vln. *p*

Pn. *mf*

77

Cl. *pp* *ppp*

Vln. *pp* *ppp*

Pn. *mp*

81

(all trills are up a half step)

Cl. *p* *ppp*

Vln. *pp*

Pn.

85

Cl. *ppp* *pp* *ppp*

Vln. *mp* *p > ppp* *ppp*

Pn. *ppp*

87

* (No pedal)

(♩ = 60)
(measure lasts for duration of clarinet breath)

Cl. *ppp* < *pp* *ppp* *n.* *mp* > *n.*

Vln. *pp* < *ppp* *ppp* *n.* *mp* > *n.*

Pn. *pppp* *mp* > *n.*

91 Ped. *

6. The Universe exists in many more dimensions than the four we usually experience.

Cl. *p* *mp* *pp* *p* *mp* *p* *mp*

Vln. *pp* < *p* > *pp* *p* *pp* *p*

Pn. *mp* *mf* *p* *mp* *p* *pp*

98 Ped. *

() Rising line means wider and slower vibrato, falling line opposite)*

(+ = finger mute) *(trills always halfstep up)* *(secco!)*

Cl. *p mp mf mp* 3 5

Vln. *mp p mp mf f p* (rough!)

Pn. *mp mf mp mf mp f* 3 3

101 *Ad.* *

Cl. *mf mp p pp* 3 3 3 3 *p* 3/4 5/4 6/4

Vln. *sf mp pp pp p pp* (senza vibr.)

Pn. *p mf pp mp mf* 3 3 3/4 5/4 6/4

104 *Ad.*

Cl. *mp* *pp* *p* *mp* *p* *mp* *p* *mp*

Vln. *p* *pp* *p* *mp* *p*

Pn. *p* *mp* *p* *pp* *mf* *mp* *p*

107

*

Cl. *mf* *mp* *mf* *mp* *p* *pp*

Vln. *mp* *mf* *f* *p* *sf* *mp* *pp*

Pn. *mp* *mf* *mp* *sf* *p* *mp* *pp*

110

Leg.

*

Cl. *p mp pp p < mp p*

Vln. *p < mp > p mp p*

Pn. *mp mf mp mf p*

114 *Red.* *

Cl. *mp mf f mf*

Vln. *mf mp mf f ff mp* (*rough!*)

Pn. *mf mp mp mf mp sf*

117 *p* *Red.* *

7. *Invisible Gamma Rays are constantly passing through substantial matter.*

Cl. *f* \triangleright *mf* \triangleright *mp* \triangleright *p* (senza vibr.)

Vln. *sf* \triangleright *mf* \triangleright *p*

Pn. *mp* \triangleright *mf* \triangleright *p* (Sharp!) *sf* (sempre)

120

Cl. (*molto leggero!*) $\bullet = 88$

Vln. (*pizz.*) *p* \triangleright *mp*

Pn. *p* \triangleright *mp*

124

Cl. $(\text{♩} = 104)$
mf

Vln. *(arco)*
mf

Pn.

128

Detailed description of the first system: This system covers measures 128, 129, and 130. The Clarinet part (Cl.) is in treble clef with a key signature of two sharps (F# and C#) and a 2/4 time signature. It begins with a *mf* dynamic and features a melodic line with eighth and sixteenth notes. The Violin part (Vln.) is also in treble clef with the same key signature and time signature, marked *(arco)* and *mf*, playing a similar melodic line. The Piano part (Pn.) is shown in grand staff (treble and bass clefs) with the same key signature and time signature, providing harmonic support with chords and single notes.

Cl. $(\text{♩} = 120)$
f

Vln. *(almost a glissando!)*
f

Pn.

130

Detailed description of the second system: This system covers measures 130, 131, 132, and 133. The Clarinet part (Cl.) is in treble clef with a key signature of two sharps and a 3/4 time signature, marked *f*. It features a sextuplet (6 notes) and a triplet (3 notes). The Violin part (Vln.) is in treble clef with the same key signature and time signature, marked *f* and includes the instruction *(almost a glissando!)*. It also features a sextuplet and a triplet. The Piano part (Pn.) is in grand staff with the same key signature and time signature, featuring triplets in both staves.

8. Higgs Field: Where particles gain mass.

Cl. *ff* (*♩ = 52*)

Vln. *ff* (*sul tasto, senza vibr.*) *pp*

Pn. *ff*

132

Cl. (*sotto voce, senza vibr.*) *ppp* *p* *pp* (*sempre sotto voce, senza vibr.*) *ppp* *pp*

Vln. (*ord.*) *mp* *mf* *f* *mp* *n.* (*con sord.*) *ppp*

Pn. *ff* (*L.V.*) *ff*

137

[8^{va} - 1] *Leg.*

Cl. *(ord.)* *(ord. vibr.)* *mf* *f* *mp* *n.* *ppp* *pp* *ppp* *n.*

Vln. *(senza sord.)* *(sul tasto, senza vibr.)* *(ord.)* *(ord. vibr.)* *pp* *n.* *pp* *mp* *mf* *mp* *n.*

Pn. *ff* (L.V.) *pp* (L.V.)

146

[8vb] *(U.C.) (no sustain pedal change!)* *

(♩ = 96) 9. *A particle and anti-particle collide and disappear.*

Cl. *mp* *mf* *mp*

Vln. *mp* *mf*

Pn. *sf* *mp*

156

Cl. *mf* *<f* *mf*

Vln. *mp* *mf* *<f*

Pn. *mf* *<sf*

162

Cl. *f* *ff* *ssf* *Poco Rit.* *pp*

Vln. *mf* *f* *ff* *ssf* *pp*

Pn. *mf* *f* *ff* *ssf* *pp*

167

(♩ = 76)

Cl. *p* *cresc.* *mp*

Vln. (*pizz.*) *p* *cresc.* *mp*

Pn. *p* *cresc.* *mp*

171

Cl. *mf*

Vln. (*arco*) *mf*

Pn. *mf*

174

Cl. *f*

Vln. *f*

Pn. *f*

176

(♩ = 60) 10. *The Color force between quarks actually increases with distance.*

Cl. *ff* *ppp*

Vln. *ff* *pp* *cresc.*
(D string) (always continuous gliss for duration in parentheses)

Pn. *ff* *pp*
(U.C.; no sustain pedal)

178

Cl. *pp* *n. ppp* *pp* *p pp* *p > n. ppp* *pp* *p pp*

Vln. *mp* *cresc.* *mf* (E string)

Pn. *p* *mp* *mf* *mp*

185

Cl. *p* *mp* *n.* *ppp* *pp*

Vln. *f*

Pn. *mf* *mp* *f* *sf f* *p* *f* *sf*

193

(end U. C.; NO other pedal!)

Cl. *p* *pp* *p*

Vln. *mf* *f* *mf* *f* *mf* *f*

Pn. *f* *mp* *mf* *f* *sf* *mf* *mp*

196

Cl. *mp* *sf* *mp* *sf* *mf* *sf* *sf* *sf* *sf*

Vln. *sff* *mp* *sf* *sf* *mf* *sf* *sf* *sf* *sff*

Pn. *f* *sf* *mf* *f*

199

(Begin to improvise as furiously as possible, only on A, using any and all registers. Use similar material to that already in the dance. End exactly with clarinet and violin.)

*11. A charmed quark is heavier than a proton.
(which is made of three quarks!)*

(♩.=152)

Cl. *p mp p*

Vln. *p <mp p*

Pn. *p*

203

Cl. *<mp p*

Vln. *mp*

Pn. *<mp p mp*

208

Cl. *mp* *mf*

Vln. *mf > mp* *mf*

Pn. *mf* *mf*

212

Cl. *mp* *mf* *f* *mp*

Vln. *mp* *mf*

Pn. *f* *mf* *sf* *mf*

216

Cl. *f* *(simile)* *cresc.*

Vln. *f* *(simile)* *cresc.*

Pn. *(simile)*

219

Cl. *(♩ = 114)* *sf*

Vln. *sf*

Pn. *sf* *fff (L.V.)*

222

sed. *

Cl. *pp*

Vln. *pp* (pizz.)

Pn. *pp*

228

(Hartford, 1/3-2/25/10)