

Exotic Particles and the Confinement of Quarks

A Subatomic Fantasy for Wind Ensemble

for Ray E. Cramer and the Indiana University Wind Ensemble

by
Don Freund
(ASCAP)

Complete Band Instrumentation

1 - Full Score (Large Score Available)
1 - Piccolo
3 - Flute 1
3 - Flute 2
1 - Oboe 1
1 - Oboe 2
1 - E^b Clarinet
3 - B^b Clarinet 1
3 - B^b Clarinet 2
4 - B^b Clarinet 3
2 - B^b Bass Clarinet
1 - B^b Contrabass Clarinet
1 - E^b Contra-Alto Clarinet
2 - Contrabassoon or String Bass
1 - B^b Soprano Saxophone
2 - E^b Alto Saxophone 1
2 - E^b Alto Saxophone 2
2 - B^b Tenor Saxophone
1 - E^b Baritone Saxophone
1 - Bassoon 1

1 - Bassoon 2
2 - B^b Trumpet 1
2 - B^b Trumpet 2
2 - B^b Trumpet 3
2 - B^b Trumpet 4
1 - Horn 1
1 - Horn 2
1 - Horn 3
1 - Horn 4
2 - Trombone 1
2 - Trombone 2
2 - Trombone 3
2 - Trombone 4 (Bass)
1 - Euphonium 1 (B.C.)
1 - Euphonium 2 (B.C.)
1 - Euphonium 1 (T.C.)
1 - Euphonium 2 (T.C.)
2 - Tuba 1
2 - Tuba 2
2 - Piano / Celesta

1 - Percussion 1
Glockenspiel (sounds 28ves higher), Xylophone (sounds 1 octave higher) [may share with Percussion 2], Chimes [may share with Percussion 4]
Large Tamtam (heavy beater and triangle beater)
1 - Percussion 2
Vibraphone, Xylophone (sounds 1 octave higher) [may share with Percussion 1], 3 Tuned Gongs (G³, B^{b3}, F^{#3}), Small Suspended Cymbal, Brake Drum
1 - Percussion 3
Marimba, Small Tamtam, Medium Hand Drum, Wood Block
1 - Percussion 4
Crotales (2 octave set), Chimes [may share with Percussion 1], Large Almglocke (F^{#4}), High Brake Drum, Slide Whistle, 2 Suspended Cymbals, Triangle
1 - Percussion 5
3 Tomtoms, Slit Drum (2 pitches), Low Snare Drum, Bass Drum, Small Suspended Cymbal, 2 Wood Blocks, Small Tambourine, Large Tambourine, Large Cowbell, Lion's Roar (ossia Bass Drum w/Superball mallet)
1 - Percussion 6
3 Timpani (G², B³, F^{#3}), Small Tamtam, High Bongo, Splash Cymbal (wood stick), Ratchet, Claves, Police Whistle

One extra set of percussion parts included

About the Music - - -

In April of 2004, Indiana University Physics Professor Alex Dzierba presented his Distinguished Faculty Research Lecture: Exotic Particles and the Confinement of Quarks. Within the proton's hot, bubbling cauldron of activity, quarks and glue move at nearly light speed and quarks and anti-quarks pop continuously in and out of existence. When pried even one proton's width apart (less than one trillionth the size of an atom), quarks experience ten tons of force pulling them together. Quarks are so small that we have not been able to measure their size; they take up less than one billionth of the space inside the proton. Particle accelerators can blast quarks out of a nucleus, but within much less than a billionth of a nanosecond "free" quarks join with newly created ones and brand new particles are formed.

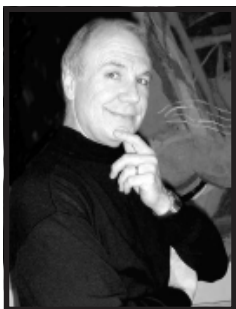
Now, thanks to the marvels of modern compositional technology, we are able to expand the world of the quark billions of billions of billions of times to produce an aural replica encompassing eight minutes of time and the space and sound range of a large wind ensemble. It is thus possible to hear evanescent particles come into being and disappear, massless neutrinos passing through, and even the moaning low brass of the confined quarks. We are amazed to discover that at this magnification one can even hear the passing of time in bits of a Morse code mantra that seems to take on a syncopated groove. At one point the violent batterings of colliding particles threaten to break this world apart but the superpowerful force of gluon surges to bring things back together.

The depictions and accounts presented in this work are solely those of the composer, and in no way is the IU Department of Physics responsible for their accuracy. Furthermore the Department of Bands cannot be held liable for any disfiguring of the listener's psycho-acoustic physiology created by the use of the lion's roar or androgynous C triads (with a quarter-tone third.)

Exotic Particles and the Confinement of Quarks was written in celebration of the tenure of Ray E. Cramer as IU's Director of Bands as he prepares for his retirement, which we suspect will be superactive, exotic, and wonderfully quarky.

*Paraphrased from a flyer provided by the Jefferson Lab (the Thomas Jefferson National Accelerator Facility.) Bona fide information about Alex Dzierba and his research can be found at <http://dustbunny.physics.indiana.edu/~dzierba/>

About the Composer - - -



Don Freund has composed over 100 performed works, ranging from solo, chamber, and orchestral music to pieces involving live performance with electronic instruments, music for dance and large theatre works; he is also active as a pianist, conductor, and lecturer. He has received a Guggenheim Foundation Fellowship (2005), two grants from the National Endowment for the Arts, and numerous other awards, prizes and commissions. Don Freund was born in Pittsburgh in 1947; he studied at Duquesne University and earned his graduate degrees at the Eastman School of Music. His composition teachers were Joseph Willcox Jenkins, Darius Milhaud, Charles Jones, Wayne Barlow, Warren Benson, and Samuel Adler. From 1972 to 1992 he was chairman of the Composition Department at Memphis State University. As founder and coordinator of Memphis State University's Annual New Music Festival, he programmed close to a thousand new American works; he has been conductor or pianist in the performance of some two hundred new pieces, usually in collaboration with the composer. He has been Professor of Composition at the Indiana University School of Music since 1992. Teaching composition continues to be a major component of Freund's career; students from 30 years of teaching have won an impressive array of awards and recognitions.

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A Subatomic Fantasy for Wind Ensemble
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2004

CONDUCTOR'S FULL SCORE
Approx. Performance Time = 8:00

♩ = 144 ♩ = ♩, ♩ = 76

8 11

Piccolo

Flutes 1 & 2

Oboes 1 & 2

E♭ Clarinet

B♭ Clarinets 1 2 3

B♭ Bass Clarinets

B♭ Contrabass Clarinet
(parts also available for E♭ Contralto Clarinet and String Bass)

B♭ Soprano Saxophone

E♭ Alto Saxophones 1 & 2

B♭ Tenor Saxophone

E♭ Baritone Saxophone

Bassoons 1 & 2

Trumpets in B♭ 1 & 2 3 & 4

(2nd horn "high") 1 & 2

Horns in F (3rd horn "low") 3 & 4

Trombones 1 & 2 3 & 4 (Bass)

Euphoniums

Tubas

Piano
(doubles celesta)

Percussion 1
Glockenspiel

Percussion 2
Vibraphone

Percussion 3
Marimba

Percussion 4
Almglocke *soft rubber mallets*

Percussion 5
shake Small Tambourine

Percussion 6
Splash Cymbal
wood stick

connected: "bloom"

Picc.
 Fl. 1 & 2
 Ob. 1 & 2
 B♭ Cl.
 1
 B♭ Cl. 2
 3
 Bs. Cl.
 B♭ Cb. Cl.
 S. Sax.
 A. Sax. 1 & 2
 T. Sax.
 B. Sax.
 Bn. 1 & 2

Measures 14, 18, and 22 are highlighted with boxes. Dynamics include *ff*, *f*, *f > p*, *p*, and *f p*.

1 & 2
 B♭ Tpts.
 3 & 4
 1 & 2
 Hns. (F)
 3 & 4
 1 & 2
 Tn.
 3 & 4
 Euph.
 Tuba

Measures 14, 18, and 22 are highlighted with boxes. Dynamics include *p*, *mf*, *f*, *f p*, *f p p*, *f p p p*, *f p p p*, *f p p*, *f p*, *1. solo*, *tutti*, *mutated*, *harmon muted stem extended*, and *play loud enough to match open horn 1*.

Piano
 Perc. 1
 Perc. 2
 Perc. 3
 Perc. 4
 Perc. 5
 Perc. 6

Measures 14, 18, and 22 are highlighted with boxes. Percussion parts include:

- Vibraphone: *mf*
- Small Susp. Cymbal: *p* (vibe mallet)
- Marimba: *p*, *mf*
- High Brake Drum: *p*, *mf*
- Low Snare Drum: *ff* (snares on), *pp*, *mp* (wood sticks, stay below marimba)
- Ratchet: *pp*, *mp* (stay below marimba)
- Slide Whistle: *ff*
- Glockenspiel: *f* (Glockenspiel)

flutter (top note only)

Picc. *f p f p f p f p f p*

Fl. 1 & 2

Ob. 1 & 2 *1. solo p* *tutti mf p*

E♭ Cl. *ff* *tutti mp mp f pp f pp f pp f pp*

B♭ Cl. 1 *ff* *tutti mp mp f pp f pp f pp*

B♭ Cl. 2 *mp mp f pp f pp f pp*

B♭ Cl. 3

Bs. Cl.

B♭ Ch. Cl.

S. Sax. *fp fp fp fp fp fp*

A. Sax. 1 & 2 *1. solo fp fp fp fp*

T. Sax.

B. Sax.

Bn. 1 & 2 *tutti mf p*

straight muted

Bb Tpts. *1. solo p* *2. solo p cup muted* *3. solo harmon muted stem extended* *tutti open p*

3 & 4 *f* *play loud enough to continue the line from trombone 3* *p f p f*

Hns (F) 1 & 2 *mf*

3 & 4 *f*

Tn. 1 & 2 *3. solo straight muted p mf*

3 & 4 *p mf*

Euph. *1. solo mf p mf*

Tb. *ossia: octave lower*

Piano *ff* *f* *f*

Prc. 1 *f*

Prc. 2

Prc. 3 *mf ff p mf p mf p mf p mf*

Prc. 4

Prc. 5 *snare off pp mp*

Prc. 6