Kaija Saariaho: *Petals* for Violoncello and Live Electronics
(For component 3: Appraising)

Background information and performance circumstances

The composer

Kaija Saariaho (born 1952) is one of the foremost living composers. Finnish by birth, she has lived in Paris for many years. After studying at the Sibelius Academy in Helsinki, where she founded the 'Ears Open' organisation, with Magnus Lindberg and Esa Pekka-Salonen, she moved to Freiburg, Germany, studying with the English composer Brian Ferneyhough. A turning point came in 1980 when she heard music by the French 'Spectral' composers Tristan Murail and Gerard Grisey. This experience led her, in 1982, to study at the Institute de Recherche et Coordination Acoustique/Musicale (IRCAM), in Paris. Saariaho's interests included computer-based sound spectrum analysis, electronic music, music combining live performance and electronics and the use of computers in the actual composition of music. A series of bold works from the 1980s, the *Jardin Secret* series, mixed live and electronically processed sounds. These works experimented not only in the contrasts between instrumental and electronic/recorded sound, but also with the expansion of the sounds possible from conventional instruments so that instrumental sounds could sound like electronics. *Petals* is an 'offshoot' of this series (see below). Besides many chamber works, Saariaho has also written several large orchestral pieces (with and without electronics) and, recently, has written several successful operas, adapting her uncompromising earlier style to accommodate vocalists. She has received many prestigious awards, including the Prix Italia, the Polar Music prize, and for the recording of her opera *L'amour de loin*, a Grammy. She lives in Paris, with her husband, the composer Jean-Baptiste Barriere.

Spectralism

Saariaho is often named as a member of the 'Spectralist' school of composition, which originated in Paris and in particular around the IRCAM. In truth, all the composers associated with this label write very different music, but share a common 'aesthetic' based on the use of computer analysis of sound as the basis for composition. Any instrumental sound consists not only of the main pitch that we hear – the **fundamental** – but also of higher, much quieter sounds above, called **harmonics** or **partials**. The exact details of and the relative volumes of these harmonics determine the **tone quality** or **timbre** of a sound. By using computers to analyse the harmonics in a sound, the structure of the sound can be 'converted' into a chord, which can then be used as the basis for musical composition. For example, in *Gondwana*, an orchestral work by Tristan Murail, two 'spectral' chords are used: the first is derived from a bell sound and the second from a single trombone note.

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Petals

Petals was written in 1988, and was first performed in Bremen, by the Finnish cellist Anssi Kartunnen. Kartunnen has since become a regular collaborator with Saariaho, giving first performances of most of her six Solo Cello works, and also of four works involving cello as soloist with an ensemble or orchestra. ***Petals*** itself is based on ideas from ***Nympheas*** (*Jardin Secret* III) (1987), a piece for string quartet and electronics, with material derived from the spectral analysis of complex cello sounds. The very first gesture of ***Petals*** is virtually identical to the last bars of the cello part in ***Nympheas***. ***Nympheas*** (Water-lilies) has another association, with the famous series of paintings by Claude Monet – and as a smaller piece using fragments from the larger, ***Petals*** is an appropriate name.

Performing forces and their handling

Petals can be performed either as a purely solo piece for cello, or with electronic amplification and signal processing. In either case, the range of timbres produced by the cello alone is so wide as to suggest the use of electronics, even when not there. Like John Cage, in his pieces for prepared piano, Saariaho transforms a traditional instrument into a multi-timbral synthesiser, elevating timbre, and changes of timbre, into a structural principle, equivalent perhaps to that of tonality in earlier musical styles. Modern ('avant garde') composers had been exploring the possibilities of extended instrumental or vocal technique for some years (Berio – *Sequenza* series; Ericcson –'General speech'), and in writing a virtuosic solo work that makes ever more outrageous demands of the performer, Saariaho is joining an honourable tradition stretching back to J.S. Bach, whose own solo cello suites were considered daring in his day! One of Saariaho's main sonic concerns in *Petals* is the contrast between 'clean' and 'noisy' sounds – from the clearest high harmonic, to the rich 'scratching' produced by the heaviest of bow pressures near the bridge. (In the electronic version, the harmoniser exaggerates this further by 'detuning' the pitches of the cello.) In a sense, Saariaho sees 'clean' and 'noisy' timbres as a replacement for consonance and dissonance – two of the pillars of tonal and atonal music.
The cello writing here includes many playing techniques (these are outlined in detail, with the symbols used on the score, at the beginning of the piece):

- *'Normal'* bowed playing
- *Pizzicato* and *left-hand pizzicato*
- Placement of the bow *sul ponticello* or *sul tasto*
- Use of *tremolando* bowing
- Use of *flautando* bowing
- Use of heavy bow pressure to produce a scratching sound, replacing an audible pitch with noise
- Smooth transitions between all of the above
- *Glissandi* (smooth slides) between notes
- Playing with normal, exaggerated, or without, vibrato
- Use of *natural* (open string) and *artificial harmonics*
- Gradual change of left-hand pressure to move from *normal* to *harmonic* note (and vice versa)
- Trills and mordents
- Double stops
- Use of micro-intervals – in this case quarter-*tones*
- Frequent use of both subtle and exaggerated *dynamic change*
- **Simultaneous** use of more than one of the above is common.

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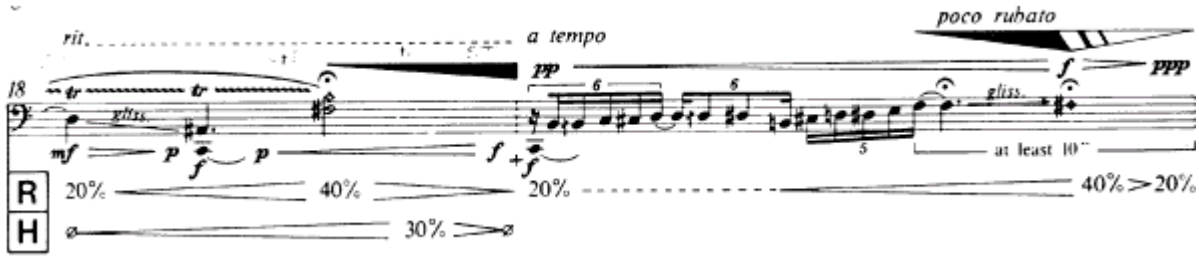

The above example shows many of the techniques outlined above. Whilst *trilling*, the cellist *diminuendos* on a D, with a *glissando* towards the next note. The *trill* continues, while a *double stop* is created by the *left-hand pizzicato*, and the note begins to *crescendo.* An *artificial harmonic* is played next, *crescendo*, with an *increase in bow pressure* obscuring the pitch with *noise.* The second phrase begins with a *left-hand pizzicato*, followed by a passage using *chromatic quarter-tone*s, *crescendo,* to a held F. Finally, this note *glissandos* upwards, while the *left-hand pressure* moves towards a *harmonic* and the *bow pressure increases* and then *decreases* with a *diminuendo* to *ppp.*

Electronics

Although not mandatory, the use of Saariaho's suggested amplification/signal processing set-up does enhance and clarify some of the concerns of the solo cello version.

Amplification itself (a fairly close microphone is suggested) brings out some of the timbral detail in the quieter sounds, while the use of **Reverberation (R)** can give an effect not unlike that of a sustaining pedal on a piano, making some of the slowest music easier to sustain as a performer, perhaps. In addition, a **Harmoniser (H)** effect is used at times, 'detuning' the input pitch by adding pitches a quarter tone above and below simultaneously.
The score gives exact instructions for the use of these effects, using 'conventional' **dynamic** '**hairpins**' to indicate increases or decreases in the amount of effect fed back through the system, expressed as a **percentage** of the maximum. Saariaho's use of both effects is musical, and quite sparing. In particular, the use of the Harmoniser coincides often with increases in the amount of 'noise' brought about by increased bow pressure, while reverb is used most often to support the quieter, lighter sounds, and to smooth over changes in slow passages of double-stops.

Structure

Petals does not follow a conventional musical structure, or indeed try to tell a story through a narrative structure. Instead, it seems to be concerned with the tension between two types of material, and with the exploration of a myriad of timbres. Saariaho describes the two types of material here as:

- 'fragile coloristic passages' (Type A)
- 'more energetic events with clear rhythmic and melodic character' (Type B).

Broadly, these types of material alternate throughout the piece, with each type of material undergoing its own transformations. The piece can be divided into seven sections. (In this piece it is more useful to consider 'staves', rather than bars, as a basic unit of measurement.)

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Section	Staves	Tempo	Comments
1	1–3	Lento – free	Type A – single notes, glissandi, trills, tremolandi and bow noise
2	4–7	♩=60	Type B – rapid demisemiquaver figures/quarter-tone 'chromatic' figures
3	8–9	Lento – free	Type A – slow two-part texture over a D pedal
4	10–13	♩=54/66/40	Type B – more conventional melodic ideas with a rhythmic focus
5	13–16	Lento – free	Type A – slow two-part texture with high artificial harmonics
6	17–27	♩=60	Type B – many 'variations' on an idea heard at the beginning of 17
7	28–30	Lento – free	Type A – concluding section with similarities to section 3. Bow noise quite prominent here

Texture

Petals uses very few textures that can be conventionally described, but there are instances of the following:

- Monophonic textures – staves 1–3. Cello moves from F to G, but the changes in timbre, the trills, increased bow noise, and (if used) the reverb and detuning via the harmoniser, all create a much richer sonic palate than this label suggests. Staves 4–7 contain a much more straightforward treatment of a single-line texture.
- Two-part textures – sections 3, 5 and 7.
- Pedal/Drone textures – sections 3 and 5 have long passages where a held note is heard against notes in the other part. In section 3 the drone note is a D, while in section 5 it settles on a high G♯, played as an artificial harmonic. Staves 17–27 also are based around a pedal/drone, this time articulated by pizzicato and between staves 23 and 27, and sustained as a bass note staves 20–22.

Tonality

As suggested earlier, pitch organisation in its traditional sense is not really Saariaho's concern in this piece. However, if the idea of a 'tonic' can be said to encompass a frequently sounded note, or a note given (even for a short time) greater prominence than others (whether by repetition or by greater length), then there are sections of this pieces where these kinds of gestures are made:

- The repeated low C during staves 17–27 becomes very familiar to the ear (as does the high F♯ that concludes nearly every phrase in this section).
- Certain dyads (two-note chords) D/A (stave 9), C–A♯ (stave 16) and the final C–B sound as points of 'resolution', perhaps because of their position at the end of sections.

However, in essence this is **atonal music**, and perhaps even music where the questions of tonality are not relevant.

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Harmony

- If tonality is not really important -here, then conventional ideas of harmony are also largely **absent**, in the sense of beat-to-beat movement between vertical pitch structures.
- The 'harmony' used here is embedded within the rich timbral mixes – for example, even the very first note of the piece has a rich series of overtones above the notated 'F', as the harmonic is not only played, but also a trill is being performed. Exact sounds generated in gestures like this will vary, and cannot be notated.
- Spectral analysis of cello sounds was used in the creation of pitch material of this piece, meaning that the harmonics of a sound, normally experienced **simultaneously** as a **timbre,** are heard successively, as melodic entities. Saariaho has said that she regards 'timbre as vertical … and harmony as horizontal'. The passage from staves 17–27 is a good example of this.

Melody

In the sections with 'more energetic events with clear rhythmic and melodic character', Saariaho does state and develop a number of melodic ideas.

- Saariaho uses micro-intervals here – specifically **quarter-tones**, meaning that she can divide the octave in 24 equal steps instead of the usual 12.
- Staves 4–7: in a passage which is clearly taken from the cello part of *Nympheas*, the melodic ideas are very densely packed into chromatic scale-like phrases, often overlapping the beats, and which gradually work from the G that closes stave 3, upwards to the C that opens stave 8. Note how the last stave of the section (7) uses *glissandi,* perhaps as the logical extreme of microtonal movement.
- Stave 10: an upwards idea (almost an exact **retrograde**, in pitch and rhythm, of a passage in violin 2 from *Nympheas*), developed **sequentially**, featuring augmented fourth leaps, trills/mordents and a general agitated character.
- Stave $10^{9}/11^{6}$: a falling idea, based around repetitions and elaborations around a more or less fixed groups of pitches, rather like a mode or scale – in this case the notes (reading downwards) F♯, E♭, D, B♭, A and G♯ are the 'core' of this structure.
- Staves 17–27 have three (very closely related) ideas:
    - Staves 17–19: five gradually lengthening version of the same basic shape, beginning on a pizzicato low C, from which a major seventh interval leaps to a B–A♯ semitonal trill, and then finishing on a high F♯.
    - Staves 20–22: working with basically the same idea, but this time with a held low C beneath the climb upwards, and with a *glissando* to the highest note. Staves 21–22 reverse the direction to return (by more or less the same route) to a concluding low C.
    - Staves 23–27: a return to the pizzicato notes at the low end of the phrase, with seven very similar phrases, of which the first five finish on a high F♯, as before, this time played *tremolando*. The sixth phrase here slides from the high F♯ the complete compass of the phrase back to the low C, while the seventh extends the range of the idea to its extreme, by sliding further up from the usual top note, to the highest note possible.

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Rhythm, metre and tempo

The composer explores some very basic and stark contrasts here.

- The sections with a **notated tempo** are all slow, with a range from around 54 beats per minute to 66.
- These tempi are varied during the course of phrases by *accelerandi* and by *ritenuti*.
- The *lento* sections are essentially **pulseless**, the instruction being given that each stave in this tempo should last 'at *leas*t 20 seconds'.
- In the electronic version the reverberation adds to the sense of 'free timelessness' by blurring and overlapping the beginnings of notes.
- There is therefore tension in the work between the sections where **pulse** is evident, and those in which it is not.
- There is a large range of rhythmic gestures used in the metrically active sections:
    - The rapid **dectuplets** of staves 4–7.
    - The rather agitated rhythms of staves 10–13, often involving **syncopations** within **septuplets/quintuplets** (with the steady flow also often interrupted by *rits* or by pauses.
    - Passages where the notes are as fast as possible – ('grace note' notation staves 21–22).
- In general the rhythms become less defined during the course of the piece, with less and less exactly measured material being found from stave 22 onwards.

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