

Michael Kieran Harvey Collection

new music for keyboard

# the school of natural philosophy

move

All my life I have been fascinated by the interaction of science and art, especially with music. In an age where art music seems to have been relegated to the area of palliative care by “market forces”, the uncompromising approach of some composers still willing to embrace science and the natural world seems to me very much in the spirit of the Enlightenment: to oppose the monolithic hegemonies of church, state and ideology, and instead fight for pluralism and individual freedom, to think for oneself, and to pursue one’s curiosity.

Martin Friedel is one such composer – a trained scientist, he is also one of the few Australian composers able to earn his living purely from composing. His *School* pieces are brief but compelling snapshots of discoveries unimaginable without the Enlightenment.

Stars and our relationship to nature are the undercurrents of Graham Hair’s 3 extant *transcendental* etudes.

Douglas Knehans’ *Boyd Panels* were written at Bundanon, and conjure up the stillness, diversity and playfulness of the natural world, so breathtakingly evident in the Shoalhaven area of New South Wales. The failure of the Biosphere project is a reminder of how reliant we are on millions of other species for our survival on Earth, and in Australia this species diversity is increasingly only possible through private oases like Bundanon.

Surreal images of nature like Boyd’s crucified trees link in my mind to Paredes’ *Triptico*, where the Calligram, or beautiful symbol, could be the intricate equations of string theory, or A Contra Luz, against the light, could represent the bending of light by gravity.

This makes *Coruscations* an appropriate inclusion, especially as the recent explanation for the Auroras surrounding the earth are “magnetic reconnections”, the result of magnetic field lines colliding and releasing large amounts of kinetic energy towards earth.

I grew up with an expectation of a lifetime pursuit of music which was propelled by the idea of the end of posterity. The awe-inspiring scale of such cosmic forces makes human hubris seem pitifully trite, yet makes human creativity and love seem all the more endearingly mysterious.

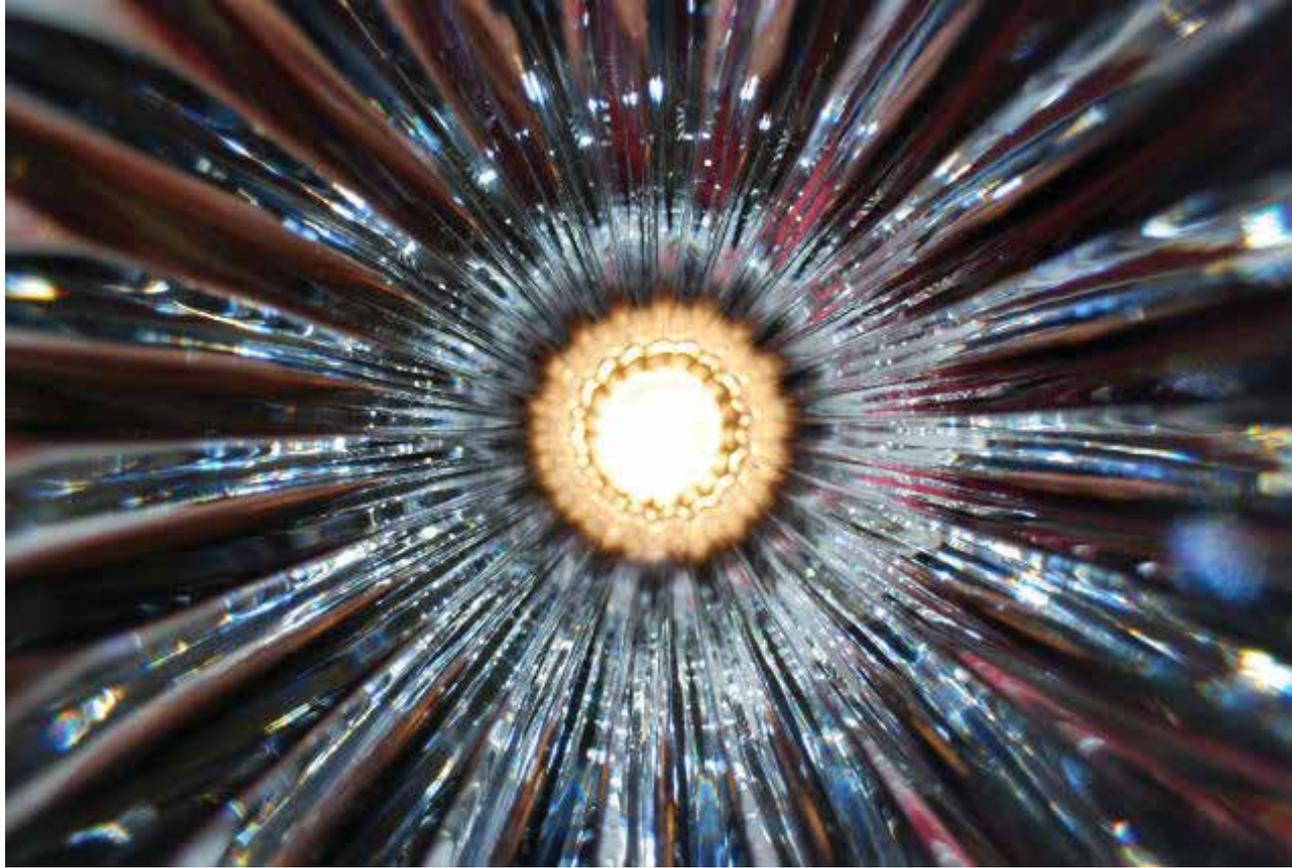
*Michael Kieran Harvey*

**Martin Friedel**  
(b.1945)

The School  
of Natural  
Philosophy  
(1995-2006)

*The School of Natural Philosophy* is not word play or whimsical invention. Natural Philosophy is the 19<sup>th</sup> century name for physics. *The School of Natural Philosophy* is the name engraved over the doorway of a gothic revival building in the middle of Melbourne University. Here, I spent five years as undergraduate and postgraduate student pursuing the teenage fantasy of becoming a physicist. During my third year, driven by vague impulses, I wandered into the equally archaically named Conservatorium of Music and found a piano teacher. Slowly, without clear ambition or aim I drifted into music.

By the time my doctoral thesis on the Mössbauer Effect was accepted and I was prepared for life as a scientist, I had succumbed to the experimental charms of the La Mama Theatre in Carlton and set about the new and difficult



task of becoming a composer. My long preoccupation with physics ended; gone forever, so I thought. But nothing goes forever.

Some years later, while composing and directing music for a Brisbane production of Brechts' Galileo, fragments of 'natural philosophy' started to reappear in my thoughts. No longer a coherent discipline but colourful shards; random pieces out of the blue. A half remembered language with strange sounding names remote from everyday life; their meaning expressed in arcane symbols and the elegant calligraphy of mathematical equations. It would be exaggerating to say

I had totally forgotten their meaning. Nothing is ever forgotten. But now I was an onlooker not a participant; a dilettante. It took effort and mental archaeology to remember anything of consequence; what remained was more of a feeling of familiarity, of having been there before. My real surprise was to find that these remembered bits and pieces of 'natural philosophy' came with little waves

of sound and sometimes images of the mathematically elegant and abstract iconography of notated music. This music seemed to evoke in a shadowy way, the interplay between mass, energy, force and space and time that lies at the heart of natural philosophy.

Later, when I worked some of this musical material into my cantata 'The Third Planet', I became aware again of the beauty of the invisible and abstract worlds that exist when we allow ourselves to think and imagine in certain ways. This perhaps, is one of the ways how mathematics and music connect with and mirror each other.

**1** *The refraction of light* from air to water. A beam of light bends when passing between transparent media of different densities.

**2** *Descarte's space* is a mathematical abstraction of the three dimensional world we inhabit; commonly referred to as Cartesian, after the philosopher and mathematician René Descartes (1596–1650).

**3** *Gravitational attraction*: The gravitational force of attraction keeps our feet on the ground and plays a crucial role in both old (classical) and new (quantum) physics.

**4** *Interference pattern*: press two adjoining fingers together. With one eye, look at a light through the small crack between the fingers. The pattern of light and dark that can be seen is an interference pattern, readily explained by the wave theory of light.

**5** *Brownian motion* is named after Scottish botanist Robert Brown who first observed the random motion of small pollen particles suspended in water. In 1905, Einstein showed that the movement of these particles was the result of collisions with the invisible, fast moving molecules that surrounded them.

**6** *The ether* was postulated in the late 19<sup>th</sup>C as the invisible substance that filled all space and provided the medium for the wave-like propagation of light and all the other forms of electromagnetic radiation. The need for the ether was dispensed with in Einstein's Special

Theory of Relativity.

**7** *Minkowski's Weltlinie* is a line in the four-dimensional space-time of Herman Minkowski, Einstein's one time mathematics teacher. Our own lives trace individual invisible worldlines through space and time.

**8** *De Broglie's wave* is the wave-like duality associated with matter and follows the discovery that matter has a wave-like aspect – and vice-versa: the particle-wave duality.

**9** *The wave equation* is Schrödinger's Wave Equation and provides a mathematical frame work for the motion and energy of particles within quantum mechanics.

**10** ... *and one of its solutions* ... in the world of quantum mechanics an exact location or state for particles does not exist, only a probability.

**11** *Heavy water* is water (H<sub>2</sub>O) where the hydrogen has been replaced by its heavier sibling, the isotope Deuterium. The water we drink contains a tiny fraction of heavy water.

**12** *Schrödinger's cat*: a “thought experiment” illustrating the paradoxes and ambiguities of quantum mechanics: a cat in a closed box may be considered alive or dead until the box is opened and the state (alive or dead) of the cat can be observed and verified; there is an equal probability that the cat is alive or dead. The cat therefore continues to occupy (mathematically at least) both states simultaneously ... alive and dead.

**Graham Hair (b. 1943)**

## Transcendental Concert Studies (1984–2000)

*Transcendental Concert Studies (on Themes from the Australian Poets)* are written for a virtuoso pianist: two of them were written originally as test pieces for international piano competitions. They are based on musical ideas suggested by quotations from John Shaw Neilson, James McAuley, Rosemary Dobson, Mark O'Connor, Alan Gould, A D Hope, Christopher Brennan and David Malouf.

The idea of composing a series of *Transcendental Concert Studies* is one I have cherished for a long time. In case the title seems pretentious, let me hasten to say that the adjective ‘transcendental’ refers to the level of pianism required to play them, and is not an a priori claim to quality! Certainly, the level of pianism required for my studies approaches that of the Liszt studies, often considered to be the most difficult works in the piano repertoire: an extraordinary pianist is required.

Unlike the other two studies on this program,

**13** *Under Aldebaran* is more obviously ‘modernist’ in expressive approach than the other two. It begins with an introduction in which something like a ‘bell-tree strike’ is heard several times, from under which haze a number of

fragmentary thematic images emerge. These are then combined in various ways to make a set of variations, each with its own 'colour', 'texture' and 'gesture' repertoire. In addition, each variation contains passing anticipations of those to come, and passing recalls of those recently heard. All of this is drawn from a twelve-tone series which is, however, heard as such only in the (ornamented) sequence of twelve single tones which comprises the coda, high up in the top register of the piano. The title and musical idea come from the collection of poems of the same name by Tasmanian poet James McAuley. *Aldebaran* is the double-star which constantly changes colour.

**14** *Wild Cherries and Honeycomb*. Australian poet John Shaw Neilson (1972-1942) was of Scottish parentage on both sides. Unlike James McAuley, who was a professor of poetry, Neilson was a manual worker for most of his life. Legend sometimes had it that the only poetry he which made serious impact on him was that of the Bible and Robert Burns, but there is some symbolist imagery and other evidence of more recent influences. Nevertheless, the occasional use of home-spun and archaic titles and language ('thee' and 'thou' etc) suggests an (unforced) feeling for folk elements in his poetic manner. The poem from which it comes is a 'ballad' of a sort, with nine verses. So the nine sections form a continuous narrative sweep, though each 'verse' shakes something new out

of its sleeve (so to speak) and there are some 'changes of tone'. Although the piece is atonal its large-scale tonal design, despite the final settling on the top C trill. It is also full of consonant or quasi-consonant harmonies, and diatonic or near-diatonic melodic licks despite the dissonant and chromatic counterfoil elements. The piece makes truly formidable pianistic demands on the performer." (GH).

**15** *Dances and Devilment and Sunlit Airs*. Again, the title comes from John Shaw Neilson, but this study intertwines images of the three contrasted types suggested by the title in a mosaic of constantly fluctuating textures from which more extensive statements of one or the other emerge at three or four points. Its deliberately capricious form is intended as a counterfoil to *Wild Cherries and Honeycomb*, which is a moto perpetuo with a single structural sweep, and unlike the atonal *Under Aldebaran* it is in C major (sort of!). *Dances and Devilment and Sunlit Airs* was premiered by Michael Kieran Harvey on ABC-TV in 2000.

*Graham Hair*

My first impressions of Graham Hair (now 25 years ago) were as a really cool dude at the cutting edge of contemporary art music performance, and as a lecturer so excitable that he would become a blurred image in front of a class of mostly supine and mystified students. He was the keyboard player with Australia's premier

touring contemporary music ensemble Flederman, which caused all sorts of ructions in the Australian music scene. After several spectacularly successful US tours and performances at the BBC Proms in 1988, the group disbanded, but each of the members went on to become icons of Australian musical life. They proved that high standards of performing difficult contemporary scores could have a following, even in Australia. I decided to dedicate myself to the pursuit of this difficult and hardly audience-friendly life largely as a result of the example set by Professor Hair. I owe him a further debt in recommending me to replace him as the keyboardist in the group "Pipeline" which he set up with the trombonist Simone de Haan after the demise of Flederman in 1989. It was with great sadness that I realised we were losing one of our best composers to the University of Glasgow. His interest in intellectual rigour, and in raising the artform to the highest pinnacle of human endeavour and thought has never wavered, as his research on the composers such as Babbitt, Seiber, Thomas Wilson, Don Banks and others also attests. He is not without a sense of humour, however, as his witty (and mind-bogglingly difficult) arrangements of mostly big-band era music proves.

*Michael Kieran Harvey*

**Douglas Knehans (b.1957)**

## Boyd Panels (2002)

*Boyd Panels* was written during my residency at the Bundanon Artists Centre on the Shoalhaven River, a property left to the Australian Government by the renowned, late Australian artist Arthur Boyd. While at this very special part of Australia I wrote a great deal of music over a two week period – a new orchestral work, a new clarinet, violin and piano trio, some songs and these five short piano pieces. These pieces were inspired by the dense natural magnetism of Bundanon itself and its superb setting which Boyd appreciated for its unspoiled, meditative landscape and dramatic outcroppings of hill and rock.

The most famous of these – *Pulpit Rock* – Boyd immortalized in canvas after canvas to the point where it is now an iconic feature of Bundanon and the Shoalhaven area. The other natural feature of the landscape is the spectacular, winding and moody Shoalhaven River. Boyd's intuitive synthesis of these strong features of the landscape (bold harshness contrasting lyrical fragility) with aspects of his own obsessions with classical studies (mythology, classical form, etc.), religious mysticism, musings on the delicacy of life and the inevitability of death, presented a powerful mixture of influences and inspiration for these short works for piano.

Two of the works are based on the strong, almost otherworldly force, of the landscape and light of the area itself. **16** *Meditation at Pulpit Rock* begins the work with a muscular yet not loud series of chords that form a type of chorale, the harmonic richness and colouring of which is reflective of the force of light on the variegated forms of Pulpit Rock, itself a magnificent copper-red rock outcropping. **18** *Shoalhaven Light - Late Afternoon* is also a response to the impressive awesomeness of late afternoon sunlight on this special landscape.

The three other works in the set are all reflections on paintings of Boyd's which are everywhere at Bundanon. **17** *Crucifixion and Rose* is a stark, bizarre panel imbued with naturalism, Christian mysticism and grace with its depiction of Jesus on a Crucifix that is planted directly into the river like many of the dead trees still upstanding in the Shoalhaven riverbed. Floating beside is a large rose with a prominent thorn. In the background are the rocky, dry hills of the Shoalhaven.

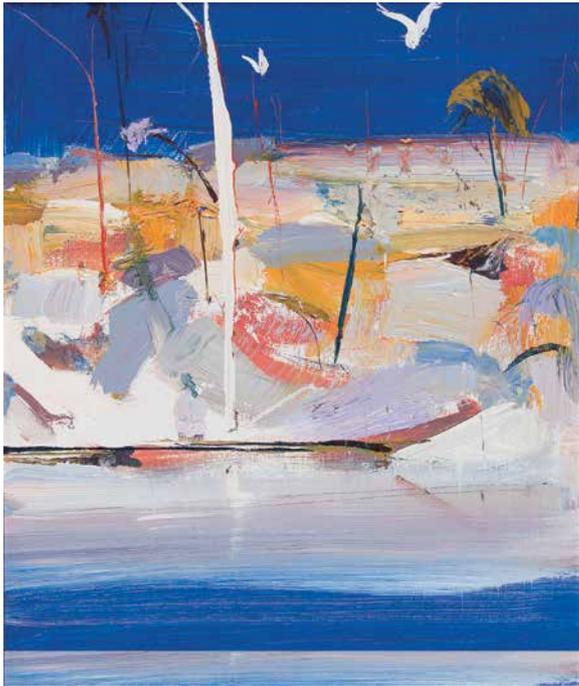
**19** *The Magic Fish* again alludes to the famous parable of the loaves and fishes and is a painting of enormous energy and movement with a large fish spewing a near perfect arc of water as it is wrestled, wriggling, to the rocks.

**20** *Black River*, which concludes the set, is based on the famous painting *Flame Trees, Horse's Skull, Black River*. In this work a flame tree seems

to grow directly out of a horse's skull, which is wrapped in barbed wire with Pulpit Rock as the backdrop and Black River horizontally bisecting the picture directly in the middle. To the side, in the background, a woman in a dark dress carries a naked infant in her arms as she walks towards the skull. Again, the crucifixion theme imbedded in this bizarre and wonderfully stark painting alludes to Boyd's other central themes: the fragility of life and inevitability of death.

Yet within this message lies also the hope of rebirth and regeneration represented by the dualistic meaning of the impossibly blood-red/fire-red blooms of the flame tree and the infant being carried to the centre, to the 'now' of the painting. I love this painting for its simplicity, power, subtlety, drama and classical balance. I have sought to bring these qualities out in my five short works in homage to Boyd, his artistic vision, and this magical part of Australia.

*Douglas Knehans*

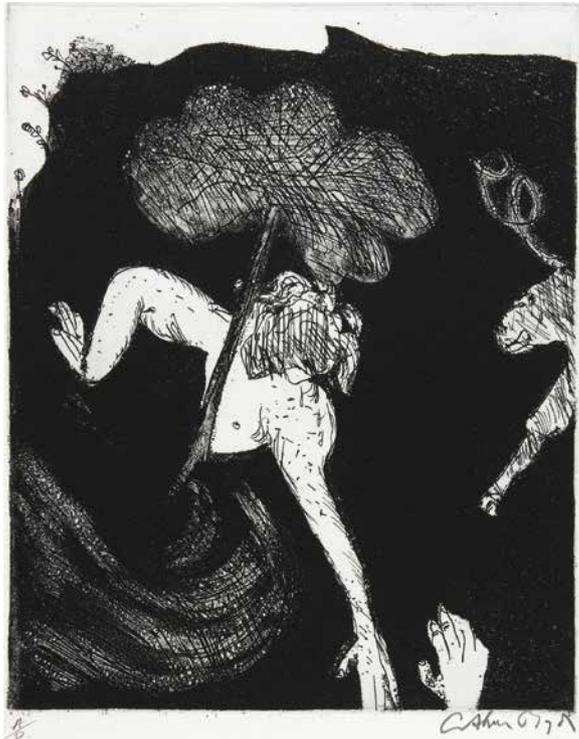
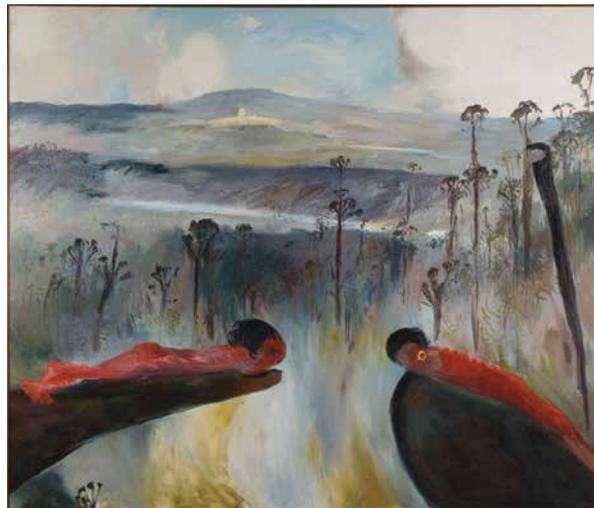
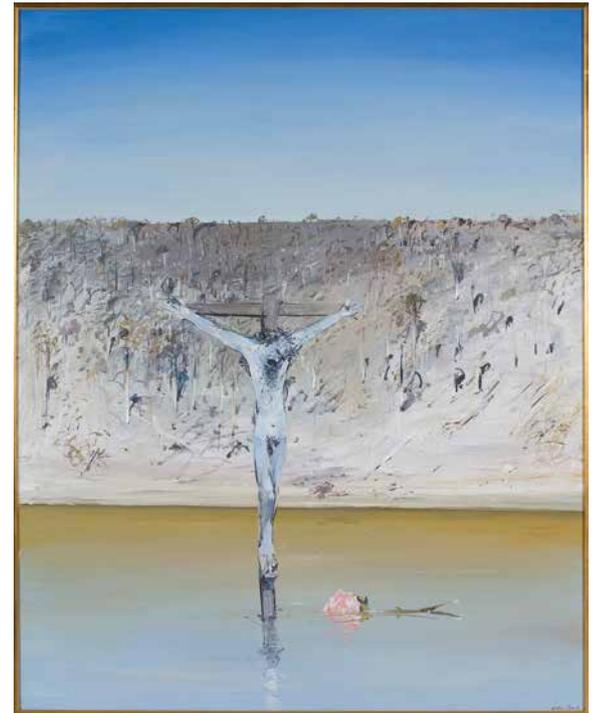


The Bundanon Trust is a unique organisation in Australia. Gifted to the Australian people in 1993 by Arthur and Yvonne Boyd the Bundanon properties are located on 1100 hectares of pristine bushland overlooking the Shoalhaven River. Bundanon's mission is to support the development of arts practice across all disciplines and to enable public access to the arts.

Bundanon Trust is custodian of the Boyd family art collection; the historic Bundanon homestead and Arthur Boyd's studio. Adjacent to the homestead is Bundanon's artist in residence accommodation which houses artists from around the world. An active education program provides for school children from all over Australia to stay on the properties and engage in the creative arts.

Arthur's wish was that this inspirational landscape be shared with both emerging and established artists. The artists who experience Bundanon are inevitably moved and re-invigorated in their arts practice by that which inspired Boyd and by his legacy.

Bundanon Trust PO Box 3343 Nowra North NSW 2541  
[www.bundanon.com.au](http://www.bundanon.com.au)



All Arthur Boyd paintings reproduced by kind permission of the Bundanon Trust.  
 TOP LEFT: Shoalhaven rise (1995) – oil on canvas  
 ABOVE: Hanging rocks and bathers (c.1970) – oil on canvas  
 BOTTOM LEFT: The writer and his muse: Orpheus and Eurydice (1993) – etching  
 TOP RIGHT: Crucifixion and rose (1979-80) – oil on canvas  
 RIGHT: The magic fish (c.1978) – oil on canvas

## Hilda Paredes (b.1957)

### Triptico (original 1994 version)

The three pieces under the title *Triptico* were my first incursion into writing for the piano. With so much great literature being written for the piano, adding to it is a rather daunting undertaking. I approached the work as if it was a triptych of lead pencil drawings, without the extra colours that an ensemble could provide and I limited the writing to the use of the keyboard only, to fulfil this task. The result was three contrasting pieces each one of them based on one idea.

**21** *Caligrama* has an introduction in the high register of the piano which breaks into a full flow of running figurations across the keyboard, from the bottom F# of the piano. This first piece is dedicated to the Mexican pianist Raul Herrera.

The introduction of **22** *A Contraluz*, is free and cantabile and it contrasts with the repetitive figurations that keep reappearing in different shades.

Finally in **23** *Parabola* I explore the virtuoso possibilities of the instrument and it contains more contrasting elements than either of the others.

*Triptico* was commissioned by Dirección de Actividades Musicales UNAM, in Mexico and it was completed in 1994.

*Hilda Paredes*

Hilda wrote me a quintet entitled *Cotidales* to play with the Arditti Quartet commissioned by the 2001 Melbourne Festival. This was a wonderful experience for me, as well as a great honour. After the successful premiere I asked her whether she might have any solo piano works, and she handed me *Triptico*. I was bowled over, and promised all sorts of performances and recordings, without properly studying the intricate score. Seven years later I finally got around to recording it, only to find that by now it had metamorphosised into a totally different version. After pleading with Hilda she agreed to let me release the original version.

*Michael Kieran Harvey*

## Richard Meale (b.1932)

### 24 Coruscations (1971)

This work is Meale's major opus for piano solo. It is an imaginative evocation of the lights of the Aurora Borealis and is also one of the first uncompromisingly modernist Australian works, and marks the coming of age of contemporary Australian composition. The influence of both Boulez and Messiaen is clear, from the pitch classes and cross-rhythms to the careful manipulation of durations and attacks, but there is also a remarkable freedom in the notation which allows for un-metered interpretation by the performer.

The success of the piece therefore relies heavily on the fundamental technique of the performer.

The adaptation of this work for electronic keyboard followed a discussion with the composer at the Barossa Festival in 1999. After presenting the work many times as a solo acoustic piano work, and realizing that another Meale opus for piano (and possibly other forces) was a long way off I had the idea of orchestrating Meale's iconic piece by injecting it with the electronic sounds of the 1960s.

This idea was suggested by Meale's original notation, which ranges from the coruscating pitch fields of the title, through landscapes of organ-like stasis, echoes, attacks, silences and digital delay reminiscent in my mind of the soundtrack to *2001: A Space Odyssey*. An improvement on the original? Hardly. A statement about the future of the acoustic piano? Maybe. An irritating liberty in interpretation? Absolutely. All I can recall of Richard's reaction to the idea at the 1999 Barossa Festival was a wicked grin and slow nod.

I hope this live recording on the Kawai MP90000 made in 2000, and so far the only performance of this version is to his iconoclastic taste.

*Michael Kieran Harvey*

### **Martin Friedel**

came to Australia with his family from Germany as a child in the 1950s. His family settled in Narbethong, a small saw milling settlement on the Great Dividing Range in Victoria



and he went on to complete degrees in physics and mathematics and a PhD in chemistry from Melbourne University. Concurrently, he studied piano with Victor Stephenson and later, conducting with Robert Rosen.

Friedel's early reputation in the 1970s was established in theatre. In the 1970s he composed and directed for productions at the Pram Factory, Melbourne Theatre Company and other major Australian theatre companies. Working in the theatre with playwrights focussed his interest on the relation between words and music and he has composed six chamber operas, four large scale cantatas and other choral works, many using his own texts including some based on themes from science. Since 1985, the Melbourne based ASTRA has premiered many of his chamber and vocal compositions, most recently the instrumental septet *Invisible Landscapes* (2008). Some of the pieces in *The School of Natural Philosophy* were first performed in ASTRA concerts as part of his cantatas.

Since the 1980s Friedel has supported an independent existence by composing for film and television, creating over sixty TV and film sound tracks for BBC, French and US television, ABC and SBS. He has received two AFI nominations and international awards including an Emmy.

### Since 2000, **Graham**

**Hair** has divided his time between Scotland, Australia and the United States.

During this time he has been Professor of Music at Glasgow University and Visiting Professor at Monash, ANU and Radford, and conducted several composition and performance projects in Boston.



He becomes Professor Emeritus toward the end of 2008, after which he will continue conducting research projects in all three countries, including an ARC-funded project on aspects of microtonal music based in Wollongong and an empirical musicology project (using scientific methods to investigate aspects of musical performance), based in Glasgow University's Engineering School (funded by the Royal Society of Edinburgh). Aspects of his research are documented on the website of the Network for Interdisciplinary Studies in Science, Technology and Music ([www.n-ism.org/People/graham.php](http://www.n-ism.org/People/graham.php)).

Most of his music over the last 20 years has been for women's voices (accompanied by harp, piano, percussion, duo, string quartet, ensemble or orchestra), including the ensembles "Scottish Voices" (which he directs), "Halcyon" (Sydney), "Pandora's Vox" (Boston) and "Mockingbirds" (San Francisco). Several of these pieces will be recorded in the US in 2009. More information about them is available on the "Scottish Voices" website ([www.scottishvoices.org.uk](http://www.scottishvoices.org.uk)). His orchestral piece "Into the Shores of Light" (inspired by poems of Australian poet Mark O'Connor) was released by ERM in Virginia in 2007.

Since 1990, he has been based in Glasgow.

Before that, he was Head of Composition at the Sydney Conservatorium (1980-1990), and taught at LaTrobe University (1975-1980). He was born in Geelong in 1943.

**Douglas Knehans'** works have been broadcast on the Australian Broadcasting Corporation, as well as in USA and Italy. His music has been commissioned and performed by some of Australia and America's leading ensembles and soloists and he has been featured in two books on Australian music (*A Handbook of Australian Music* and *A Companion to Music in Australia*) as well as the International Who's Who in Music and Musicians Directory (UK).



Knehans holds degrees in music from ANU, Queens College, City University of New York and Yale University. His compositions have been performed in Prague, Rome, Kiev, Ukraine, the Jerusalem Academy of Music and Dance in Israel, at the New Music - New Faces Festival in Krakow, Poland and at the Kennedy Center in Washington D.C. Recently the Verdehr Trio performed his work *rive* in Brisbane, Melbourne, Adelaide and Hobart as well as in London, Athens and Thessaloniki by. In 2005 a new work for mezzosoprano and orchestra was given in L'Aquila and Rome.

Between 2000-2006 he was Director of the Tasmanian Conservatorium of Music and is currently Dean of the College-Conservatory of Music at the University of Cincinnati. His music is published by Armadillo Edition, New Haven, American Composers Alliance, Michigan State University Press and the Australian Music Centre.

Firmly established as one of the leading Mexican composers of her generation, **Hilda Paredes** has made her home in London since 1979 and her music is now performed widely around the world.



As an active participant in master classes at Dartington Summer School, studied with Peter Maxwell Davies and Richard Rodney Bennett. After graduating at the Guildhall School of Music, she obtained her Master of Arts at City University in London and completed her PhD at Manchester University.

Her collaboration with choreographers led her to receive the Music for Dance Award from the Arts Council of Great Britain in 1988. After taking part at the Garden Venture Opera Project in Dartington, she completed her first chamber opera *The seventh seed*.

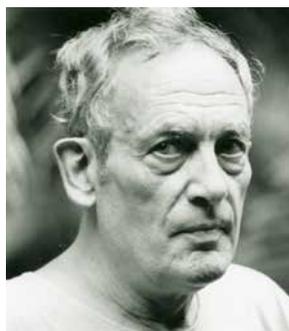
She has continued to be involved in the musical life of her native country, teaching at the University in Mexico City as well as radio producer of new music.

She has been recipient of important awards, such as the Arts Council of Great Britain fellowship for composers; the Rockefeller, Fund for Culture Mexico/USA and more recently the JS Guggenheim Fellowship in the USA. She has taught composition and lectured at Manchester University, the University of San Diego California, as well as in Mexico, Spain, at Centre Acanthes in France and was appointed the 2007 Darius Milhaud Visiting Professor at Mills College in the US.

In her catalogue there are also

electroacoustic works, chamber operas, string quartets, and a piano trio. She has been commissioned by soloists, ensembles and orchestras around the world.

“Paredes is a composer with a fresh aural imagination, while her Carter-like use of instrumentalists as dramatic protagonists gives her music an extra dimension.” *The Guardian* (2005)



### **Richard Meale**

(b1932) is one of the towering figures of Australian composition. After initial music studies in piano, clarinet, harp, history and theory at the Sydney Conservatorium, Meale

also studied non-Western music at UCLA, especially Japanese court music and Javanese and Balinese gamelan. His early works such as the *Sonata for flute and piano* (1960) introduced many of the methods of the international avant-garde to Australia, and *Coruscations* (1971) is a kind of culmination of these techniques. During this period Richard Meale also played a crucial part in the propagation of avant-garde music in Australia as a pianist, lecturer and broadcaster and conductor as well as composing. His style after *Viridian* (1979) and *String Quartet No. 2* (1980) showed a marked change of direction, becoming more exclusively lyrical and embracing a frank tonality. From 1969 to 1988 he was Reader in Composition at the music faculty of the University of Adelaide. In 2000, Meale was conferred Doctor of Letters honoris causa by the University of New England.



### **Michael Kieran Harvey**

was born in Sydney and studied piano with Alan Jenkins, Gordon

Watson, and at the Liszt Academy, Budapest, under Sándor Falvai. His career has been notable for its diversity and wide repertoire. He has especially promoted the works of Australian and contemporary composers and recorded well over 30 solo CDs on various labels. Harvey's awards include the Grand Prix in the Ivo Pogorelich Competition, USA (1993), the Debussy Medal, Paris (1986) and the Australian government's Centenary Medal (2002). The Michael Kieran Harvey Scholarship was established in 2006 to encourage future directions in Australian keyboard art music. He is currently an adjunct professor at the Tasmanian Conservatorium.

**Recording engineers** - Martin Wright | Vaughan McAlley

**Editing** - Vaughan McAlley

**Mastering** - Martin Wright

**Recording venue** - Move Records studio (except track 24)

**Piano** - Yamaha C7

**Cover** - detail from *Shoalhaven rise* (Arthur Boyd)

**Photographs** - Kanako Okamoto (page 2),

Belinda Webster (Richard Meale), Tony Hutchings (Hilda Paredes)

Martin Friedel (b.1945)

**The School of Natural Philosophy**  
(24'24")

- 1 The refraction of light 0'52"
- 2 Descarte's space 1'50"
- 3 Gravitational attraction 2'05"
- 4 Interference pattern 0'36"
- 5 Brownian motion 0'41"
- 6 The ether rings 3'02"
- 7 Minkowski's Weltlinie 2'09"
- 8 De Broglie's wave 0'54"
- 9 The wave equation 3'34"
- 10 ... and one of its solutions 3'43"
- 11 Heavy water 2'34"
- 12 Schrödinger's cat 1'38"

Graham Hair (b.1943)

**Trancendental concert studies on  
themes from the Australian poets**  
(12'55")

- 13 Under Aldebaran 3'54"
- 14 Wild cherries and honeycomb 5'35"
- 15 Dances and devilment and sunlit airs  
2'48"

Douglas Knehans (b.1957)

**Boyd Panels** (13'30")

- 16 Meditation at Pulpit Rock 2'59"
- 17 Crucifixion and rose 1'29"
- 18 Shoalhaven light 4'22"
- 19 The magic fish 2'09"
- 20 Black river 2'16"

Hilda Paredes (b.1957)

**Triptico** (15'04")

- 21 Caligrama 5'20"
- 22 A contraluz 5'20"
- 23 Parábola 4'21"

Richard Meale (b.1932)

arr. Michael Kieran Harvey (b.1961)

- 24 **Coruscations** (8'22")

