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A Patch of Her Own:

Contemporary Women in Experimental Electronic Music

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Introduction

While there's significant and well-deserved coverage of electronic music's older female pioneers, there isn't yet sufficient academic or professional energy devoted to understanding the achievements of young women working today.

Starting in 2012, USC's Annenberg Inclusion Initiative has since reported that 2023 was the year with the highest recorded percentage of female producers at 6.5%.¹ This is still a remarkably low, disappointing amount. For that reason (and more), I'm excited to highlight three important female producers working today who, despite *not* reaching arbitrary standards of musical success (charting, for instance), have indeed managed to cultivate a formidable discography, release critically-acclaimed or well-received albums, establish themselves in a burgeoning music industry, have achieved name recognition, have signed to reputable recording labels, and regularly perform their music on tour.

I'm specifically focusing on three young female producers working primarily in experimental electronic music, each of whom carry a comparatively smaller audience. (For all intents and purposes, audiences at or under approximately 500,000 listeners qualify as small.) As such, notable contemporary performers like Björk, Karin Dreijer (Fever Ray, The Knife), Goldfrapp, Grimes, Imogen Heap, Laura Les, Santigold, Charli XCX (et cetera), while indeed qualifying as female producers of electronic music, do not qualify in the stipulations I've laid out with regard to age or size of listening audience (in other words, fame), and as such will not be my subjects of exploration. I'll also

¹ See Stacy L. Smith, et al., "Inclusion in the Recording Studio? Gender and Race/Ethnicity of Artists, Songwriters & Producers Across 1,200 Popular Songs From 2012 to 2023." *Annenberg Inclusion Initiative*, January 30, 2024.

be excluding analysis of artist groups—specifically, duos and trios. For this reason, I won't be looking at collaborative EPs or albums² done by my featured producers.

Despite my focus on women's work in experimental electronic music today, I'm also refusing to make any essentialist or generalizing claims about men and women. Farrugia and Olszakowski correctly note that “women and electronic music’ as a complex and often incoherent landscape and not a homogenous essentialist category” (4). Both “women” and “electronic music” are famously indeterminate, unfixed terms used to categorize and simplify their respective groups, and for those reasons (and more) I hope to be as specific and as concrete as possible in my examples.

EQUAL—a Spotify-backed initiative established in 2020 to boost recognition of women in music—notes that “[t]he diminished presence of women in audio isn't for a lack of talent, ambition, or ability,” and, in fact, “it is substantially more difficult for women and [gender non-conforming] people to gain access to careers in pro-audio.”³ Echoing these sentiments, I hope to disprove this very misunderstanding regarding women in electronic music culture. The problem is not an inherent lack of female presence in electronic music; women have famously been working in electronic music since its inception as a genre. Rather, it is a lack of effective and substantive representation. In their 2017 article “Introduction to Women and Electronic Dance Music Culture,” Rebekah Farrugia and Magdalena Olszanowski agree that, quote, “focusing on a lack is an affront to the women who form the scene and have developed it throughout its history” (2)—women like Laurie Anderson, Wendy Carlos, Suzanne Ciani, Delia Derbyshire, Pauline Oliveros, Daphne Oram, and Laurie Spiegel. Indeed,

² Such as Loraine James' *053* (YEAR) with TSVI, or Kaitlyn Aurelia Smith and Emile Mosseri's *I Could Be Your Dog / I Could Be Your Moon* (2022).

³ The EQUAL Directory.

women have and continue to actively participate in every aspect of electronic music culture. Backing up Farrugia's and Olszanowski's claim, the "insistence of 'a lack' of women involved" (1) is curtailed by the collective creative work of today's young female producers—specifically, Arushi Jain, Loraine James, and Kaitlyn Aurelia Smith.

Women's electronic music-adjacent roles range from the commercial and technical to the creative and performative (creative director, visual artist, graphic designer, photographer, dancer, stylist—the list goes on). Often, women inhabit one or more of these roles at any time, given the changeability, unpredictability, and general lack of job security inherent to electronic music (and music at large) as a commercial industry. According to Farrugia and Olszanowski, "[t]here are many women who take on roles as agents, promoters, designers, VJs and other forms of labour that support EDM. Some do this while also being producers, performers and DJs, as well as having other jobs. They are an operational necessity" (2). Even the women that form the industry's infrastructure—women who run labels, A&R, manage artists, or work as staff—are woefully underrecognized.

Producers, Composers and Performers

There's a necessary distinction to be made between the Western classical composers of the 18th-century and contemporary composers of electronic music. The word "composer" carries certain connotations that refer almost exclusively to composers of 18th-century Western classical music. Yet according to Merriam-Webster, composer refers to a person who writes music. In fact, many composers are also the performers of their own pieces.

There is a tendency to call the creator a composer if their work is largely acoustic (or ostensibly *not electronic*). Think of the centuries-old classics—Bach, Beethoven, Brahms, Chopin, Mozart, Handel, Schubert, Tchaikovsky, Vivaldi, Wagner; the list goes on—or their 21st-century contemporaries, like Angelo Badalamenti, William Basinski, John Carpenter, Nils Frahm, Philip Glass, Julia Holter, Ryuichi Sakamoto, or Hans Zimmer. And yet, by definition, a composer writes music (compositions) that need not necessarily be performed by other musicians. A common practice for pianists, say, is to perform compositions created by other artists.

Some artists, like Kelly Lee Owens, Sofia Kourtesis, and TOKiMONSTA, are relatively well-known and successful as both producers and DJs. But producers and DJs (or composers and DJs) need not necessarily be both. It's important to note that while words like producer, composer, performer, and DJ are often used interchangeably, they remain distinct occupations with distinct requisite actions. Producers will generally compose, arrange, and record original music, while DJs, using CDJ/DJ controllers, literally “mix” together two or more individual tracks for a live or prerecorded performance. Often, putting on a DJ performance as a producer suggests a level of intimacy and familiarity with one's selection of curated music—and equally implies that one's own music will be included as part of the mix.

Highly-regarded (or up-and-coming) producers are frequently invited by radio stations, streaming services, or online broadcasting services to either curate a radio mix—including The Lot Radio, NTS Radio, BBC Radio 1, and Dublab—or perform live, as on HÖR Berlin, Patch Notes, and Fact Live. Most notably, a DJ may be invited to perform a set for Boiler Room, a popular UK-based online music broadcaster and club promoter actively operating in big cities all over the world. In 2020,

Arushi Jain was invited to perform remotely for Boiler Room; in 2019, Loraine James performed live for Fact Magazine at their 180 Studios in London; that same year, Kaitlyn Aurelia Smith also performed remotely for Fact Magazine's Patch Notes web series, which focuses on artists producing with hardware modular synthesizers.

Artists like Sherelle and Yaeji have also previously made waves online with their respective DJ sets for Boiler Room. Some artists, like Peggy Gou, Maya Jane Coles, and Nina Kraviz, are repeat guests. Boiler Room sets in particular are among the most popular recorded live shows—and the sets are something of a success-cycle: a rising DJ is asked to perform a set, and the set continues to boost their success, image, and size of audience.

DJs or producers enjoying a degree of popularity may be invited to curate their own DJ-KiCKS album—a DJ mix album released under the Berlin-based !K7 Records label. Since 1993, DJ-KiCKS has earned a reputation for foregrounding up-and-coming DJs and electronic music producers—and, as a consequence, works as a helpful, often critical point-of-reference for contemporary electronic music. However, music magazine Resident Advisor notes that women make up less than 12% of the DJ-KiCKS roster.⁴ Jessy Lanza—one of James' Hyperdub label-mates who released her own DJ-KiCKS album in 2019—herself acknowledges this lack of visibility in a 2016 YouTube interview for Vice's NOISEY: “I think visibility is very important. [There] is a tendency that in a lot of technical fields, women just aren't present... it's a lot of work trying to prove yourself all the time. So if you're in a male-dominated space there are dynamics there that you wish didn't exist, but the reality is, is that they do.”

⁴ See Katie Thomas, “Jessy Lanza — DJ Kicks.” *Resident Advisor*, December 10, 2021, <https://ra.co/reviews/34510>.

Those “dynamics” Lanza refers to can be understood as a set of expectations imposed on the women who’ve entered that maladapted space. The problem of women’s visibility is further complicated by the problem of differentiating one’s technical role from another. The reason words like producer, performer, and composer are often used in aggregate is simply because artists working in electronic music (or any genre) typically occupy all of these roles at once. The working lives of musicians are notoriously difficult to maintain a so-called sense of balance across all areas of living. Independent artists in particular work several of these positions at once, and it is only with the financial and logistical support provided by a recording label that the burden of marketing, touring, and combined managerial responsibilities are lifted. Visibility in electronic music is, then, perhaps more difficult to achieve when the otherwise conventional boundaries of each working role are precarious and prone to overlap.

Artist Biographies

30-year-old Arushi Jain (formerly known as ose / ओस) is known to wear several creative-career hats at once. Born in Delhi, India, Jain is a coder, engineer, modular synthesist, technologist, composer, performer, singer, producer, and radio host for NTS Radio, where her show GHUNGHRU airs monthly. Jain also works as a full-time senior software engineer at Reddit.

After graduating with her degree in computer science at Stanford, Jain returned to campus by signing up for the Laptop Orchestra Class at Stanford’s Center for Computer Research in Music and Acoustics (CCRMA). After much trial and error with ready-to-play synthesizers (such as the Korg Minilogue, with which Jain says she got “super bored” playing), she finally found her rhythm with

modular synthesizers—synthesizers made up of discrete parts, or modules, which connect together to form a synth patch. For someone with an academic background in coding and infrastructural engineering, Jain felt immediately enamored with modular synthesis, saying “it fits the way I think.”⁵

Jain’s most critically-acclaimed albums, *Under the Lilac Sky* (2021) and *Delight* (2024), were released with the LA-based, community-centered “all genre” label Leaving Records. Jain has also released music under Boxout.fm, a label and online radio based in New Delhi, as well as her debut album *With & Without* (2019) under GHUNGHRU—an experimental record label and radio series founded by Jain in 2020 for NTS Radio.



Figure 1.1: Arushi Jain at work in her home studio. © Arushi Jain for Spitfire Audio.

28-year-old Loraine James is a composer, performer, singer, radio host, and experimental electronic music producer from Enfield, London. As a 16-year-old at the University of Westminster, James enrolled in a music production course, where she learned how to use DAWs like Logic Pro and

⁵ See Jain’s description for her *With & Without* on Bandcamp at <https://arushijain.bandcamp.com/album/with-without>.

Ableton. James graduated with a Bachelor's in Commercial Music—a degree that humorously contrasts James' sincere, emotional musical tendencies.

In 2017 (then her final year of university), James appeared on London radio station Rinse FM with producer-friend and collaborator object blue to celebrate the launch of her debut album, *Detail*. During the show, object blue [tweeted at Hyperdub](#), asking them to sign James. The tweet proved consequential: James was soon recruited by the celebrated London-based label—founded by Kode9 in 2004, whose critically-acclaimed roster boasts the likes of Burial, DJ Rashad, and Dean Blunt—who released James' 2019 follow-up *For You and I* (called DJ Mag's favorite album of the year), as well as *Reflection* (2021) and her most recent album, *Gentle Confrontation* (2023). James continues to release music with Hyperdub, following suit with her 2021 album *Reflection* and 2023's *Gentle Confrontation*, with few exceptions. *Detail* lives on the now-defunct East London Fu Inle Records, and 2022's *Build Something Beautiful For Me* currently resides on the Brighton-based label Phantom Limb.

James also currently produces music as Whatever the Weather, an alias dedicated to her more ambient-oriented work. The eponymous album was released in 2022 on Ghostly International (also home to Kaitlyn Aurelia Smith's newest releases).

James never anticipated being a full-time, touring musician. Instead, she'd been prepared to take up the path forged by her mother, working as a teacher in London. (In fact, at the time of *For You and I*'s release, she'd been working as a teaching assistant at the same primary school her mother teaches.) And as one of few queer Black women carving a niche in experimental electronic music, James is, admittedly, more timid than you'd expect from someone producing and performing such

exciting, club-ready music. “I’m a quiet, shy person as it is,” says James, in a 2019 interview for Pitchfork. “I don’t like attention.” Her music, on the other hand—with its sharp, punchy synths and booming percussion—commands it. But part of her reticence comes from one of her more dangerous modes of being: being queer, and being queer *in public*. Much of James’ discography—from song titles and lyrics to her music’s actual sonic qualities—contend with lived experiences of anti-queer hate and violence. In that same interview, James recalls “dealing with verbal abuse or physical abuse” as a gay teen; now, as a young adult, James recognizes that “although London is my hometown, I don’t feel fully safe. We [queer people] struggle to walk down the street and be our authentic selves.”

37-year-old Kaitlyn Aurelia Smith is a composer, performer, singer, and electronic music producer from Orcas Island, Washington. While studying composition and sound engineering at the Berklee College of Music in Boston, Smith composed under the indie-folk alias Ever Isles. But it was an entirely different, often-cited music experience that shaped her sound to come. One day, after a neighbor introduced her to the world of modular synthesis by lending her a Buchla 100 to play with, Smith’s website claims that she “got so distracted and enamored with the process of making sounds with it that I abandoned the next Ever Isles album.” Smith had first used her voice as her instrument of choice (followed by classical guitar and piano) before making the fateful switch to the analog synthesizer.

Like any producer just starting out, Smith started making a name for herself with a collection of self-released singles, EPs, and albums—*Milk*, *Swan - Hamsa*, *Useful Trees*, and *Cows will eat the weeds* in 2012; *Chromolume* in 2014; and *Instrumental Buchla 100* in 2015—on Bandcamp, all of

which record her voice, guitar, piano, and newly-acquired Buchla 100 on a four-track. For a majority of these early works, Smith challenged herself to create one new composition a day with “minimal refinement”—i.e., one take per track.

In 2013 Smith also founded touchtheplants, a multidisciplinary creative platform that’s part-store, part-publishing house, and part-record label home to Smith’s earlier, more modest works in synthesized ambient compositions, such as *Electronic Series Vol 1 : Abstractions* and *Tides: Music for Meditation and Yoga*. It wasn’t until Texas-based label Western Vinyl caught wind of her work that Smith was recruited for her 2015 album *Euclid*, whose title refers to the form of geometry used to compose the first six tracks. The following year, Smith paired up with renowned synth pioneer (and big influence) Suzanne Ciani for *Sunergy* (2016) as part of New York-based label RVNG Intl.’s *FRKWYS* series, which invites electronic artists across generations to collaborate on a music project. Smith continued to release two full-length albums with Western Vinyl (2016’s *EARS* and 2017’s *The Kid*) before moving to Ghostly International—another multi-genre New York label—in 2020, when she released *The Mosaic of Transformation*. The project was followed by a 2022 collaboration with Emile Mosseri (*I Could Be Your Dog / I Could Be Your Moon*, released in two parts) and *Let’s Turn It Into Sound*, also released in 2022—a markedly busy year for Smith.

Among time spent producing for herself, Smith’s original music has also appeared in film,⁶ television,⁷ and in commissions for companies like Apple, The BBC Symphony Orchestra, Epcot Center, and Google, among others.

⁶ *Brasilia: City of the Future* (2015), directed by Benjamin Dickinson; and *Duck Butter* (2018), directed by Miguel Arteta. Smith is currently scoring Bernardo Britto’s *Omni Loop* (2024).

⁷ Comedy Central’s *Broad City* (2014) and Netflix’s *Disjointed* (2017).

Sound Histories, Practices and Processes

As independently-working electronic music producers, Jain, James, and Smith are the agents of their own sonic output. At their unique creative discretion (and subject to their creative whims) they manipulate software, hardware, and various sound technologies to cultivate a sound that's resolutely themselves.

Drawing on musical conventions and forms while applying her own sonic framework, Jain's music deftly combines modular synthesis with traditional Indian music—bringing to mind the sprawling, meditative Hinduist sonic practice of Alice Coltrane, with cited inspiration from Sheila Chandra, Kara-Lis Coverdale, Ravi Shankar, and fellow modular synthesist Kaitlyn Aurelia Smith. Central to her sound practice is her use of classical Indian motifs, such as rāgas: a composition of notes, or improvisational melodic frameworks, specific to classical Indian music. From Sanskrit, “Rāga” literally translates to “color,” or “something that colors.” Similarly, Jain's music colors the senses. The soothing sonic qualities of her compositions impress (or seek to impress) upon the listener a new way of being in the world; they invite quiet contemplation, gentle disposition, and attunement with one's surroundings—a softness and lightness of being, thinking, and feeling.

From her debut *With & Without* to her most recent album *Delight*, Jain lovingly reinterprets the traditional compositional frameworks of Hindustani ragas using contemporary computer-music technology. “[T]his is a strange twisted 21st century interpretation of an ancient artistic practice - personally rejuvenated under the influence of many musical movements that are thriving worldwide

that didn't necessarily originate in India," said Jain. For *Delight*, Jain invited acoustic instrumentalists to compose for the first time alongside the cello, classical guitar, flute, marimba, and saxophone.

Jain's work easily transgresses technological and categorical boundaries of music—asking herself things like, “how can I make my synth a sitar?” during her production of *With & Without*. On her track “The Sun Swirls Within You” from 2021's *Under The Lilac Sky*, Jain swaps the percussive instruments traditionally paired with the composition for percussion made entirely from granulated, stretched samples of her voice. (Singing begins at around 5:40, and one can hear the modified vocal bits beginning at around 6:00 onward.) While there are repeated moments where the listener can clearly discern Jain's processed vocals-turned-percussion (becoming provisional synthesized/electronic sounds by virtue of audio-effects processing), it becomes increasingly difficult to parse between sung and unsung elements, effectively blurring the distinction between organic and mechanically-produced sound.

In many ways, Jain's music also transcends time and place. Following ancient raga ethos, Jain composed *Under The Lilac Sky* with the intent that it join the listener in watching the evening sun set—thus transporting them into a state of grounded bliss, of intentional listening.

Further, Jain's music crosses geographical and cultural boundaries. Her work combines classical Indian instrumentation and Hindustani raga with Western harmonization and technology (Ableton Live and Eurorack, a standardized modular synth format, were born in Germany). The ragas she invokes⁸ hail from ancient India, while her compositions make use of specific contemporary computer-music technologies updating and evolving in real-time.

⁸ Raag Bhairav, Raag Bheempalasi, Raag Asavari, Raag Bihag, and Raag Sandhi Prakash.

Jain's background in programming gave her a practical way-in to modular synthesis—a level of involvement that's especially intimidating for the uninitiated. For her, modular synthesis feels second-nature: it's "the only instrument besides my voice that [I] truly feel one with," Jain wrote in her description for *With & Without* on Bandcamp.

James' sound draws on a wealth of formative music experiences—one of which being her mother, who would play everything from Metallica and funk to soca and calypso on the steel pans. By virtue of having grown up in '90s London, James was exposed to UK-drill, grime, and electronica from an early age. As a teenager, James was also immensely fond of 2000s alternative (Death Cab for Cutie, Deftones, Paramore, Linkin Park) and math-rock acts (American Football, haisuionasa, toe, TTNG) as well as electronic artists like Dntel, Lusine, Squarepusher, and Telefon Tel Aviv. James' discography reflects her sonically-diverse upbringing, seamlessly blending elements of ambient, drill, drum n' bass, emo, glitch, grime, footwork, house, IDM, jazz, juke, jungle, post-rock, rap, and techno for an intricately textured electronic sound.

Unlike the loss of listening interest that tends to occur over a mechanic, passively-repeated four-bar drum loop (typical of most house and electronic), James' music retains the critical element of surprise; an exciting unpredictability that's especially palpable in her stuttery percussive rhythms. They're active and alive, nearly attuned to the same sort of subtle timbral shifts typically found in synth work.

James' meticulous, scattershot drum patterns and highly articulate, precise percussive layerings—arguably, her music's most memorable qualities—are proof of heavy math-rock influence at

play. Her approach to drum programming in as early as 2017's *Detail* very much resembles the way a jazz or math-rock drummer would pursue the rhythm section: producing complex, varying time signatures, leaving the listener with a rhythm that seems to hover and glide over a lush melodic framework. At around the one-minute mark of *Detail*'s second track "Loll," for example, one can hear (and feel) the slowing, jolting groove—prompting the listener's (or club-goer's) re-attention. The track combines glitchy, shifty drum patterns with James' rhythmmed vocals and sensual, lingering guitar chords—until the track reaches 3:53, when it slows into a brief synth reprieve.

Throughout the following track "On The Count of Three," the beat repeatedly skips over itself, as if literally skipping on a vinyl record. James' vocals, meanwhile, echo and undulate in woozy, rhythmmed repetitions.

James generally processes vocals in much the same way as her drums. They're chopped, stuttery, jagged—nearly as percussive as the drums. A vocal loop, like a drum loop, is established only to be broken. Her drum patterns, too, have that sort of wonky, swinging, off-the-grid feel popularized by L.A. beat-producer giants of the early 2010s, like Flying Lotus, Knxwledge, and J Dilla—only with a stronger foundation in electronic sound.

And above all, there's James herself as the foremost emotional and autobiographical element of her work: anxious, intimate, and increasingly self-assured. Her fears, anxieties, and desires (most to do with her being queer in what feels like an increasingly homophobic London) foreground much of her sonic and lyrical content.

For You and I, among other works, finds James attempting to reconcile two very primal emotions. The *desire* to enjoy, without consequence, the pleasure of being in love; and the *fear* of being

subject to anti-queer hate and violence for expressing her love. In the Bandcamp description for the album, James says, “A lot of the time I’m really scared in displaying any kind of affection in public”—a fear captured in song titles like “So Scared” and “Hand Drops,” referring to moments where James has anxiously let go of her partner’s hand while walking together in public.

Much of her more abrasive, caustic sound, James says, captures the emotional turmoil of competing desires. On describing “London Ting // Dark as Fuck (ft. Le3 bLACK)” from her album *For You and I*: “It’s the most aggressive-sounding track. I just wanted to get my feelings out, basically.” But while the fear manifests itself in darker, grittier tracks like “London Ting,” the sweetness of the love for her partner is also captured in brighter, softer tracks like “Sensual (ft. feeo).” “I’m in love and wanted to share that in some way,” continues James. “I wanted to make songs that reflect layers of my relationship.”

Exploring the entirety of Smith’s music discography feels (and sounds) like gleefully traipsing through a dense, glitter-green forest. Shimmering synths mist and cool the forest floor; airy, warped vocals breeze through the canopies; and woodwinds chitter and whistle like little jungle creatures. It’s in listening to her sprawling compositions where descriptions of nature and sound become one and the same.

So it’s safe to say that Smith’s coming-of-age in the lush, evergreen Pacific Northwest set a useful creative precedent for her sprawling, organic-electronic synth work. In fact, she intends for nature to enter the fold. In her interview with Red Bull Music Academy, Smith says that “I’ve grown

up in the natural world and live in nature now, so I feel inspired by that and want to create sound for it.” Her work draws heavily on this being-in-nature sentiment; in an official Ask Me Anything (AMA) for Reddit’s r/electronicmusic forum, Smith writes that she will always try to make sounds that “feel like moss”—i.e., lush, soft, pillowy beds of synths that combine and commingle and otherwise fluidly coexist throughout the duration of the piece. Additionally, in an interview with AdHoc Magazine, Smith explains how her compositions for *EARS* were attempts to translate nature’s sound-movements and interactions to pure synth sound: “[It’s hard] to pick out a singular sound source, because insects are overlapping with each other or with the sound of rustling. I had a lot of fun... using that as a foundation to build environments that are overlapping and feel visceral.” Her work successfully executes this nature-sound transformation. In listening to *EARS*, it’s just as difficult to parse individual sounds; her discrete synth sounds are as intricately layered and naturally integrated as the sounds of the natural world.

Many producers working in electronic music and sound design tend to describe their sounds in visual and tactile language, citing an emphasis on creating unique sonic colors and textures; impressions and qualities of sound as interpreted through a distinct but related sense (sight, touch, taste). With Smith’s work in particular, one is multi-sensorily moved by the exquisite, articulate layering of textured percussive and synth elements.

That said, attempting to understand her music sensorily plays an equally significant role in her sound-design process. In describing the process by which she shapes her sound palette, Smith attempts to “blend in as many different tones [and] timbres as possible,” thinking about the ways texture and tactility can be captured in sonic form. Perhaps regarding Smith’s music in particular, coherent

boundaries between the five senses need not apply—and, in fact, sensory reinterpretations and transformations are encouraged. “I like to mix senses,” says Smith, in an interview for Ableton. “I like to imagine what that sound would feel like if I were to touch it and vice versa... if I have a textural feel that I like—like a tennis racquet—what would that sound like?”

Composed using her voice, modular synths, granulated field recordings, mbira, and a woodwind quartet, Smith’s 2016 album *EARS* was inspired by the colorful, eccentric visual worlds of artists like Moebius and Hayao Miyazaki. “I’m always composing to a visual in my head,” said Smith (Red Bull Music Academy).

Software and Hardware

Jain uses an Elektron Digitakt, while her modular setup consists of the following parts: a formant oscillator, a CV generator and processor, a granular sampler, a multi-function utility module, linked spectral filters, a master clock and modulator, and several Expert Sleepers interfaces. In the past, she has also used the Roland TR-8 drum machine and the Ableton Push launchpad and interface. For sequencing, Jain uses her computer, voice, and a complex Eurorack sequencer. With slight deviations according to each album, her musical setup remains consistent.

James is known to both produce and perform with a relatively minimal setup, typically using only her Macbook (with which to run Ableton Live), a 25-key MIDI keyboard, an Akai APC40 clip-launching controller, and a Novation launchpad. However, for her 2023 album *Gentle Confrontation*, she opted to expand her sonic repertoire. Much of the album’s sounds come from her newly-acquired Novation Peak—an 8-voice polyphonic analog synthesizer—along with the Yamaha

Reface CP keyboard. For the track “Déjà Vu,” James transformed a field recording—the sound of wind, in particular—into a “witchy hi-hat snare thing” using a VST plugin.

For the album, James described the music-making process as occurring “half in Ableton and half out of the box.” This sort of mixed software-hardware approach gets replicated in James’ live shows, where audio or MIDI clips are triggered from Ableton Live sessions by way of launchpad or keyboard, along with James performing melodies, chords, or sequences live on hardware. In live shows, James has also implemented the use of pedals, such as Chase Bliss’s performance looper, a Microcosm granular effects pedal and Red Panda’s Raster 2, a digital delay and pitch-shifter.





Figures 2.1 and 2.2: Loraine James performing “Glitch Bitch,” “Hand Drops,” and “+44 -Thinking – Of – You – 01” for Fact Magazine, August 11, 2020.

Smith is known for her frequent use of Buchla synthesizers, such as the Buchla 100 and the 200e Music Easel. Her use of Buchla synths is distinct: while most Easel players tend to produce rigidly-sequenced, hard, and sometimes squelchy synth-sounds, the sounds Smith produces are soft, dreamy, and tonal. For live and recorded sets, Smith also uses an Arturia Keystep 32-key MIDI controller, a Buchla touchplate keyboard controller, an electronic wand MIDI controller, the duophonic Oberheim Two-Voice Pro analog synth—an analog duophonic analog-digital hybrid system—and a collection of various modules that make up her setup (including a polyphonic clock module, Make Noise’s MATHS, a mixing/routing module, and a resonant filter)—although her go-to gear consists of a polyphonic rhythm generator, a drum voice FM synth, an Electronic Dream Plant (EDP) Wasp monophonic synth, a touchplate controller, the Moog Grandmother semi-modular analog synth, the Oberheim SEM analog synth, the Roland SH-101 monophonic analog synth, the Sequential Circuits Prophet-5 polyphonic synth, and a tone generator. Smith records and performs

using Ableton Live, along with four different interfaces. The center of her entire creative practice, however, lies in the Buchla 200e Music Easel, which made up the entirety of *Tides* and *Euclid*, respectively. In an interview with Sound on Sound Magazine, Smith says, of the Buchla Music Easel: “there’s a certain resonance in Buchla instruments that I really connect to. To me, it has a more potent tone.”

For *EARS*, Smith traveled to various studios across the country to record sounds produced by the portable, monophonic EMS Synthi, Korg’s semi-modular ARP 2600 synth, the OSCar mono/duophonic synth, Korg’s Mono/Poly synth, the EML ElectroComp 101 polyphonic synth and Moog’s Werkstatt-01 synth. For *The Kid*, Smith used various Make Noise and Jomox modules. For performing *The Mosaic of Transformation* live, Smith would sample her Music Easel using a Teenage Engineering OP-1 device, effectively replicating the layering of the Buchla that takes place on the album. For *Let’s Turn it Into Sound*—her most recent album—Smith used the Buchla 200e Music Easel, the wand MIDI-controller, an Oberheim SEM module, and her EDP Wasp.



Figure 3.1: Smith using her Buchla 200e Music Easel. © Western Vinyl.

Music Production As A Social and Pedagogical Process

For learning a new skill, one will primarily take advantage of the following three resources:

- Online resources (social media platforms, web forums, subreddits, YouTube tutorials)
- Social network (friends, family, classmates, coworkers)
- Literature ('how-to' or 'self-help' books)

In all three possible pathways for acquiring music production skills, female representation is severely lacking. However, this lack is most readily visible online—especially on YouTube, where young people typically first begin to explore a new skill. A YouTube search for “electronic music production tutorial,” or some permutation of the phrase, prompts hundreds of videos created by men. In fact, only

a handful of electronic music producers actively uploading tutorials on YouTube—Rachel K. Collier, Dresage, Alice Yalcin Efe, Sarah Belle Reid, and So Wylie, for example—are women. This tremendous lack of female visibility on one of the most frequently visited video sharing platforms (and second most visited website in the world) can discourage young women early on from committing to research and further pursuing their interest in electronic music production.

This sort of exclusionary atmosphere isn't unique to online spaces. Electronic music social networks on and offline pay little attention to female interest in the craft, and for the communities that do exist with female producers in mind, membership and resources are limited. Canadian composer and artist Freida Abtan describes what she's observed as a tendency for male-dominated social networks and communities to freely exchange information among each other—a tendency that isn't necessarily observed or afforded for female social networks.

Electronic music is a DIY culture... For most, there is a significant social component, not only in learning how to produce electronic music, but also in the performance and marketing of it. The necessary skills are passed around closed communities and friendship networks, which are often predominantly male (55).⁹

This “social component” Abtan describes is often tight-knit and male-dominated. Because of this, young female producers are generally removed from social spaces where skill-sharing occurs.

Skill-sharing between men and women is not necessarily privileged, as these predominantly male communities are generally more careful or reticent to offer women the same “insider” information and

⁹ See Freida Abtan's article, “Where Is She? Finding the Women in Electronic Music Culture.” *Contemporary Music Review*, 35:1, 53-60, July 4 2016.

resources. Young women with expressed interest in learning electronic music production therefore face a representational, social, and informational lack.

In many ways, James exists as a rejection of the electronic music status-quo. She's queer, black, and minimalist in setup—a complete contradiction to what *The Guardian's* Timi Sotire calls “a predominantly white IDM scene,” while music-magazine Resident Advisor's Andra Nikolayi writes that her minimal gear set-up and openly complex queer identity “stand in direct opposition with the genre's traditionally male, white and gear-fetishising intellectualism.”

What's more: it's unusual for a high-profile touring musician to provide intimate insight into one's own demos or song arrangements on her computer—to lift the producer veil, so to speak. Nevertheless, on August 22nd, 2017, James generously demystified her music-making process by uploading a video titled “Live Performance Workshop” to her own YouTube account. Today, James continues to post videos of her Ableton arrangements and production workflows to Instagram. This sort of firsthand, technical access into the sound-processing of a particular arrangement or composition is typical of YouTube music producers who've turned it into a career—but not so much for professional touring musicians like James. While many professional electronic producers maintain a degree of privacy with regard to a particular original patch sound or synth preset, James is refreshingly forthcoming about her production, mixing, and sound process. Most importantly, she provides other female producers with what is so desperately needed: another woman's area of personal sound expertise and skill.

Looking Ahead

Fortunately, we're seeing more and more arenas—physical and digital—dedicated to bolstering women's work in music production. SoundGirls.org spotlights select artists and engineers, offers job postings, and provides a wide range of resources on grants, readings, and mentorships. Aimed at industry professionals and hiring personnel, The EQL Directory (partnering with Spotify and SoundGirls) hosts the profiles and requisite contact information for thousands of qualified women seeking work in studio recordings, tours, live music events, post-production, film and television, game audio, podcasts, and more.

Nonprofit organizations providing resources, support, and increased professional opportunity for female, trans, nonbinary and gender nonconforming producers include Equalize Her, FEMME HOUSE, Produced By a Girl, She Is The Music, SheSaid.so, We Are Moving The Needle (WAMTN), Women's Audio Mission (WAM), and Gender Amplified. FEMME HOUSE has partnered with We Are Moving The Needle, She Is The Music, Ableton, and Dolby Atmos to create She Is The Producer—a free, comprehensive bootcamp for beginner producers.

Select universities across the country offer courses and host student organizations related to women in electronic music production, but offerings generally appear to be limited. Georgia Tech's Women in Music Tech is a student organization working to encourage other women to enter the academic and professional field of music technology; Boston's Berklee College of Music offers courses on Women in Electronic Music and Music of Women Composers; and UC Santa Cruz offers a Women in Music course under their Feminist Studies department.

Opening the door for women in electronic music production also starts at an early age. Summer camps and after-school programs, like the Willie Mae Rock Camp in New York City, the Electronic Music Club in Portland, Oregon, Full Sail Labs in Florida, and the University of Michigan's Girls in Music & Technology (GiMaT) day camp provide girls K-12 with hands-on production through music hardware and software. Unfortunately, the cost of entry tends to be high for most programs (UMich's GiMaT tuition for the day sits at \$500, excluding the application fee of \$75).

Recommended Reading and Viewing

There are several thoughtfully-curated blogs and websites which provide well-researched information on women in electronic music. Founded in 1998, the female:pressure Tumblr blog provides an extensive collection of images of women at work (mixing, recording, performing, and the like); As of 2001, the Her Noise Archive has provided a "living archive" which seeks to document the relationship(s) between sound, history, and gender—and, additionally, provides a few schematics which map connections between popular female artists (see the Her Noise Map); NERDGIRLS, the "herstory of electronic music" by Antye Greie-Ripatti, has compiled select female artists over 50 years of electronic music; Women in Sound, Women on Sound (WISWOS) is an international network for connecting female artists, educators, researchers, technologists, archivists, and the like—a sort of LinkedIn for women interested in sound and music technology.

Books like Tara Rodgers' *Pink Noises* (2010), Leslie Gaston-Bird's *Women in Audio* (2020), and Helen Rusak's *Women, Music and Leadership* (2023) take stock of the diverse landscape of women experimenting with electronic sound and music across time and space.

Recent documentaries, like Stacey Lee's *Underplayed* (2020), highlight the continued inequality faced by women working in the music industry, and features TOKiMONSTA, Allison Wonderland, REZZ, and Sherelle, among others. Narrated by Laurie Anderson, Lisa Rovner's *Sisters With Transistors* (2020) recognizes some of the pioneers of women in electronic music: Suzanne Ciani, Delia Derbyshire, Pauline Oliveros, Daphne Oram, and Clara Rockmore.

Conclusion

Young women in particular deserve the scholarly analysis of and attention to their creative sonic practices. Scholarship regarding women of all ages' contributions to electronic music is relatively new, and the range of scholarship available is limited. Searches in academic databases yield few relevant results, and of the results that do generate, nearly all were published after 1980.

In reading interviews with Jain, James, and Smith, one notices a pattern of deep identification with their respective creative practices. They repeatedly describe intimate connections to their music-making machines as vehicles for self-expression. Samplers, sequencers, synthesizers: these are the producer's tools with which to churn out a diverse, personal body of work—a creative self forged in sound.

The electronic music-making process is often understood as rough, industrialized, technically-specific, and does not cohere with the image of a woman. It is generally understood that the man produces, and the woman, occupying a largely hands-off role, sings or otherwise “fronts” the performance. Noting the popular association of electronic music with men and masculinity, author Sasha Geffen acknowledges women’s ability to eventually make space (and sound) for themselves:

Electronic instruments, like all machinery, tend to be associated with masculinity. Machines signify precise and important labor, the kind that women are thought, in patriarchal mythology, to be physically incapable of performing. But ... [b]y the mid-twentieth century, electronic music technology had not been entirely masculinized, and so women stepped in to create their own meaning in its emerging sphere (90).

This is precisely what Jain, James, and Smith have done—they’ve created their own precise meanings and sound-worlds out of machine-like instruments; carved a space of their own in electronic sound. They’ve each successfully individuated their sound according to their own personal backgrounds, translating a combination of upbringings, cultural histories, and formative social and emotional experiences into wonderfully synthesized music.

Honorable Mentions

Because it is nearly impossible to sufficiently highlight the work of every young woman currently producing experimental electronic music in an undergraduate thesis, I have compiled the following non-comprehensive list of producers whose work deserves as much attention and consideration as Arushi Jain, Loraine James, and Kaitlyn Aurelia Smith.

- AFRODEUTSCHE
- Anz
- Ellen Arkbro
- Félicia Atkinson
- avas
- aya
- Caterina Barbieri
- Julianna Barwick
- Sofie Birch
- Sarah Bonito (of Kero Kero Bonito)
- Bella Boo
- Carmen Villain
- Shanti Celeste
- Clariloops
- CLoZee
- COBRAH
- Courtesy
- Cowgirl Clue
- Pan Daijing
- Sarah Davachi
- Katie Dey
- DJ_Dave
- Doss
- Eris Drew
- Eartheater
- Elkka
- Carolina Eyck
- Jayda G
- Alice Longyu Gao
- Gazelle Twin
- GiGi FM
- Alice Glass
- Grouper
- Hatis Noit
- Helena Hauff
- HAAi
- DJ Haram
- Francesca Heart
- Holly Herndon

- Celia Hollander
- horsegiirL
- Nailah Hunter
- Jenny Hval
- Ikonika
- JakoJako
- Park Hye Jin
- Jlin
- Katatonic Silentio
- Kate NV
- Kilamanzego
- Klein
- Sofia Kourtesis
- Nina Kraviz
- KUČKA
- Lafawndah
- Jessy Lanza
- Laurel Halo
- LCY
- Lisa Lerkenfeldt
- Lucy Liyou
- Lila Tirando a Violeta
- Logic1000
- Kelsey Lu
- Malibu
- Kali Malone
- Katie McBride
- Ela Minus
- Moor Mother
- more eaze
- Namasenda
- Ninajirachi
- Nite Jewel
- object blue
- Octo Octa
- Odalie
- Oklou
- Hinako Omori
- Or:la
- Otha
- Kelly Lee Owens

- Perel
- Perila
- yuné pinku
- Lyra Pramuk
- Fatima Al Qadiri
- Lucy Railton
- Hania Rani
- Sarah Belle Reid
- Ada Rook and Devi McCallion (of Black Dresses)
- claire rousay
- Ana Roxanne
- rRoxymore
- RRUCCULLA
- Sherelle
- Shygirl
- Astrid Sonne
- Diana Starshine
- SPFDJ
- Emily A. Sprague
- Yu Su
- Surgeon's Girl
- TENTENKO
- Roza Terenzi
- Time Wharp
- Tirzah
- TOKiMONSTA
- TSHA
- Ulla Straus
- upsammy
- Christina Vantzou
- H  l  ne Vogelsinger
- Patricia Wolf
- Xyla
- Yaeji
- Li Yilei

For a more comprehensive collection of more than 2,300 women and non-binary artists working today in world experimental sound and music, see Fanny Chiarello's "Basta Now: Women, Trans & Non-Binary in Experimental Music" (2024).

Definitions and Distinctions

- **Algorithmic music** is often used to describe generative techniques that may either run independent of human interaction or as a compositional addition to live coding. In some cases, algorithms have no musical relevance and are simply used by composers as a creative performance tool.
- A genre defined by its lack of traditional “composition, beat, or structured melody,” **ambient music** is often atmospheric, wandering, contemplative, less dynamic, and frequently accompanied by nature or outdoor (ambient) sounds. The term “ambient music” (as it’s used today) was popularized by English musician Brian Eno with his 1978 album *Ambient 1: Music for Airports*.
- **Computer music** incorporates elements of computing software technology in its sound design, composition, arrangement, or signal processing. Said computing technology may either help human composers create music, or run independent of human interaction, as in algorithmic composition programs. The genres ‘computer music’ and ‘electronic music’ are often used synonymously.

- **Digital Audio Workstations (DAWs)** are application software used to record, arrange, edit, and produce audio files. A software DAW may be used as an app on your phone, as a program on your laptop, or, formerly, via massive hardware computers of the late '70s. Today, software DAWs provide a virtual interface in which users can mix several tracks and recordings for sound or music purposes. Software DAWs are used to produce and record everything from sound and music to radio, podcast, and television. Popular software DAWs include Ableton Live, Audacity, Bitwig, Cubase, FL Studio, Garageband, Logic Pro, Pro Tools, Reaper, Reason, and Renoise.
- Literally “electronic dance music,” the acronym is typically used to describe music produced for club, festival, and rave spaces. **EDM** is distinguishable from purely electronic music in that it usually contains bright, sharp synth leads/supersaws, four-on-the-floor kick drums, and “beat drops.” Clearly defined subgenres/derivatives of EDM include dubstep, future bass, hardcore, and trance.
- **Electronic music** is a genre defined by its use of electronic instruments or music technology (as a way to *create*, rather than exclusively *shape* or *effect*, sound). Electronic instruments may either take the form of digital software (VST, plug-in) or hardware (synthesizer, drum machine, or theremin, for instance). As we’ll see, electronic music is a giant, complex umbrella term for genres like algorithmic music, ambient music, breakbeat, computer music, drill, drum and bass, dubstep, 8-bit (or chiptune), experimental music, future bass, garage, glitch, grime, hardstyle, house, jungle, synthwave, techno, and trance. Elements of derivative electronic music genres are bound to overlap—and this list is definitely *not* comprehensive. I’ve also

distinguished electronic music from electronic dance music (EDM) and intelligent dance music (IDM).

- Like avant-garde music, **experimental music** complicates—that is, experiments with—pre-existing forms and genres of music.
- **IDM (intelligent dance music)** is a subgenre of electronic music noted for its complex use of synthesized sounds and techno, jungle, and breakbeat rhythms. The term is often primarily associated with Aphex Twin, Autechre, μ -Ziq, Squarepusher, and Venetian Snares, among others—many of whom contend with or outright reject this term.
- **Left-field**: music that eschews typical, established genres of electronic music (such as dubstep, EDM, house). This is typically used to describe electronic-adjacent music.
- **Music Instrument Digital Interface (MIDI)**: Since the early 1980s, MIDI is a computer communications protocol that allows computers and electronic musical instruments to talk to one another. MIDI is an essential part of contemporary electronic music, as it allows producers to achieve exact control over the timing, velocity, and overall composition of the notes in their production. Most MIDI controllers are keyboards, although many take the form of launchpads—multi-buttoned, square controllers used to trigger or record audio samples or MIDI notes in real-time. Engaging with an instrument’s key, button, slider or knob will trigger a MIDI event, which sends musical instructions (such as parameters, note’s pitch, timbre, loudness, velocity, timing) to the computer or digital interface. MIDI data may be sent and received via MIDI cable or USB cable, and recorded to a sequencer or DAW to then be edited,

rearranged, or played back. Prior to MIDI as a technical standard, connections and communications between instruments were not standardized.

- **Virtual Studio Technology (VST)** is an audio plug-in software interface that integrates software synthesizers (often dubbed “soft synths”) and audio effects units into DAWs. Some VSTs are emulations of popular hardware synthesizers or samplers, providing users without the means (lack of money, space, commitment) for acquiring the physical synthesizer with a cheaper, accessible digital alternative. VSTs receive information through MIDI notes.

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