

Local student to represent Lamorinda in STEM competition



Photo provided

Isabelle Katz, center, with other award recipients.

By Jennifer Wake

Campolindo High School freshman Isabelle Katz was recently selected as a Top 30 Broadcom Masters for the 2019 National Society for Science Competition, out of more than 2,300 entrants from all over the country. Broadcom MASTERS (Math, Applied Science, Technology and Engineering for Rising Stars) is the nation's premier Science, Technology, Engineering and Mathematics middle school competition.

As a finalist, Isabelle will represent Lamorinda in Washington, D.C. the last week of October where she will present her project and

compete with the other finalists.

Isabelle's invitation to enter Broadcom was based on the Joaquin Moraga Intermediate School eighth-grader winning first place at the 2019 California State Science Fair, in the physics category as well as the Junior Sweepstakes at the Contra Costa Science Fair, for her project on characterizing musical instruments, and voice, using signal analysis.

A dedicated musician and singer, Isabelle became fascinated by the differences in tones among different brands of pianos, according to the Broadcom Masters website. She had heard ex-

perts use different adjectives to talk about those tones: "Diffuse." "Metallic." Even "fat." Those words had meaning, but they weren't very specific. Isabelle decided to see if she could use digital sound processing to get an objective characterization of both a note's frequency and its tone, or timbre. She also wanted the technique to work with other instruments besides the piano. She wondered if the method could work with sung notes as well.

Isabelle started with 10 recordings of the middle C note from three brands of pianos. She used software and an algorithm to break down a musical sound into its different frequencies. Isabelle also got data for the notes' harmonics. Those are overtones that some instruments make when a basic, or fundamental, note is played. Isabelle then went further. She used music from the "mellow" and "bright" settings on her electric piano to design a way to measure a musical sound's tone. She put her results together and got a "color fingerprint" for musical sounds.

Colored circles in the fingerprint stand for a fundamental note and its harmonics. The thickness of each circle is based on the peaks of the different frequencies. Isabelle's method could characterize notes and tones for a piano, guitar and violin. She also found a way to show if a sung note is off on its pitch. "The next step for this project is to build a working prototype smartphone app" to train singers, she says.

A new home for Nevada



Photo Sora O'Doherty

Former Orinda mayor Bobbie Landers smiles with her horse, Nevada, who has found a new home.

By Sora O'Doherty

Bobbie Landers' 27-year-old thoroughbred horse, Nevada, has finally been moved off the Pacific Gas and Electric Company land on which he had lived off Bear Creek Road. Landers had a lease on the land for 33 years, but early this year PG&E had informed her that they would not renew the lease. Landers, a former mayor of Orinda who is 90 years old and has been an active participant in many of Orinda's civic and social activities over the decades, was very stressed by having to relocate her old horse, whom she was accustomed to visit and care for twice each day. PG&E gave her several extensions, but could not offer another suitable piece of land.

Fortunately, help arrived in the form of Mike McCaffrey of Hold Your Horses. McCaffrey and company founder Chantel Tieman run the business, which specializes in rescuing horses from fires. McCaffrey has a ranch in Byron, California, where his two daughters raise show pigs.

On Sept. 20, the horse,

named Nevada was not too happy with Landers, who refused to feed him his breakfast. She believed that if he was hungry, it would be easier to lure him into a horse trailer, an experience the horse has not savored in the past. Landers' two daughters, Holly and Merrily, were on hand to help with the move. Emotions ran high as they removed Nevada's things from the barn built by their father and John Fazel many years ago. The plaque bearing Nevada's name was unfastened from his stall, ready to be transferred to his new home.

McCaffrey and Tieman arrived with a large horse trailer, in which Landers felt that Nevada would be more comfortable. McCaffrey evaluated the horse, and administered a light sedative to calm him down. After about a half hour, Nevada calmly followed Landers' daughter Holly, who had ridden him in the past, out of the barn and into the trailer, where breakfast awaited him. It was a calm ride out to his new home in Byron. Upon arrival, Nevada was led into a large corral and left to accli-

mate himself to his new surroundings. In the distance, the other side of Mount Diablo rose to the west. In a field beside the corral, two black Morgan horses came close to the fence to meet their new neighbor. Nevada, who has been alone in his field for many years since the death of his barn mate, trotted over to say hello. He cantered around the ring, looking nothing like his 27 years. He got down and rolled on the ground, and investigated his surroundings.

Finally, McCaffrey led him to his new stall, which is large and has a large run attached. One of his neighbors, a chicken, jumped up on the stall, and startled Nevada, but he took it in his stride. Across from his stall, the show pigs were calm about their new neighbor. Landers won't get to see Nevada every day any more, but she is often in Byron and will visit him regularly there. So, while it isn't as good as having him in Orinda where she can see him daily, Landers is content with Nevada's new home, and happy that the stressful process of relocating him is over.

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