

#TECHNOLOGY

Making Your GPS Better

The new technique leverages a type of radio interferometer, a device that measures the difference in arrival time of radio waves emitted by distant astronomical sources, with antennas that detect and record the emission.



A new scientific technique could significantly improve the reference frames that millions of people rely upon each day when using GPS navigation services, research shows.

For the first time, researchers have formed a radio interferometer between a GPS antenna and receiver and a large radio telescope. The new technique leverages a type of radio interferometer, a device that measures the difference in arrival time of radio waves emitted by distant astronomical sources, with antennas that detect and record the emission.

The team used an approach called *Very-Long-Baseline Interferometry* to use the sensitivity of the radio telescope to increase the GPS receiver's sensitivity. This additional sensitivity enabled them to extend the reach of the receivers to observe powerful jets of radiation and particles, generated by supermassive black holes, up to 5 billion light-years away.

The discovery will improve a variety of critical scientific measurements, from tracking small movements of land in earthquake-prone areas to understanding sea level change.

"The ability to reference new sources, directly to GPS antennas, paves the way for improvements in geodetic reference frames, which underpin modern navigation in applications from smartphones to national security," says Jonathan York, a research scientist at the University of Texas at Austin Applied Research Laboratories.

"Improving reference frames to meet the millimeter-level consistencies demanded by a variety of important Earth science applications, is critical for taking the next steps in robust precision positioning."

Using data collected at the Very Long Baseline Array facility in Fort Davis, Texas and the nearby McDonald Geodetic Observatory, the researchers were able to demonstrate multiple detections of these powerful extra-

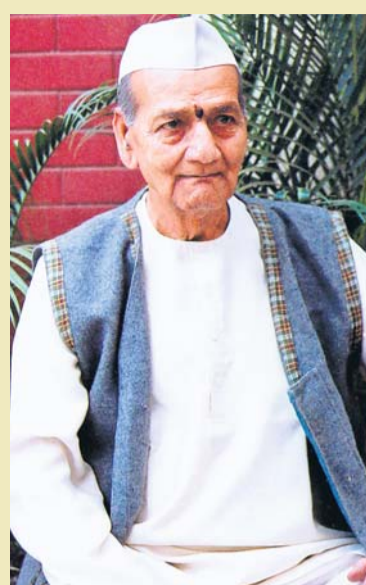


galactic jets. The detections extend the distance of signals, referenced to a GPS antenna from satellites, found about 20,000 kilometers (about 12,427 miles) away to astronomical objects, 5 billion light-years from Earth. This distance is equivalent to flying to a GPS satellite and back about 1 quintillion (a 1 followed by 18 zeros) times or an increase of 18 orders of magnitude.

"Expanding the reach of a scientific instrument is common, scientists are always trying to push their instruments to the limit, but a leap at 18 orders of magnitude is certainly extraordinary," says Leonid Petrov, lead scientist for the Space Geodesy Project at NASA Goddard Space Flight Center.

Observations, using this novel combination of antennas and receivers, will improve the accuracy of geodetic reference frames, which use a large set of locations measured by positioning techniques, such as GPS, to establish a common coordinate framework.

Future research will explore the connections between GPS positioning and the positioning based on observations of distant astronomical sources carried out by radio telescopes. Unifying these techniques will further help researchers to improve the geodetic reference frames that define how positions are measured in reference to Earth.



SHYAMCHI AAI- DUTTA PURANKI IMAGE

Sane Guruji's childhood and his interactions with his mother, Yashodabai, are filled with myriad images of values imparted through discipline, reward and punishment. Shyam who is afraid of water, is thrust into the pond along with his brothers to make him learn to swim, much against his will. This scene carries resonances of *Ishwar Chandra Vidyasagar*, swimming across the flooded waters of Damodar River, to reach his mother on the other side. Later, Shyam tells his mother how swimming helped him come home on a stormy night across flooded waters.

70 YEARS OF SHYAMCHI AAI



Dr. Shoma A. Chatterji
Film scholar,
journalist & author

Shyamchi Aai (1953) produced and directed by *Acharya P.K. Atre*, a much respected scholar in theatre, film and literature, is the first Indian film to win the President's Gold Medal, a precursor to the National Film Awards in 1954. More than 50 years later, it has become one of the most popular films of its time, restored in DVD and VCD versions for screening, to perpetuate the positive messages the film carries through a sweet story of the relationship of a mother and her second son, Shyam.

Shyamchi Aai is based on the autobiographical writings of *Pandurang Sadashiv Sane*, better known as Sane Guruji (1899-1950). He wrote the book in five days flat when he was in jail for participating in the Civil Disobedience movement in colonial times. Several generations of Maharashtrians have grown up with this book and on the landmark film based on it.

Subhash Chheda of Rudraa Home Video, bought the rights of the film including DVD and VCD rights in 2003. Over these past decades, the film has grown into a virtual movement that comprises a journey through villages, talukas and districts in the country where the film has been screened with wonderful feedback. Says Subhash Chheda, "My aim, through cinema, is not just to entertain but also to educate. This is a unique distribution and exhibition strategy that we devised by taking the film from one school to the next, to spread the story of *Sane Guruji* through the film. I had founded Rudraa to promote meaningful, educative cinema across the world. We reached out to school children across Maharashtra and nearby states. I made the DVD and VCD copies of the film available at a very low price of Rs.5.00 in some schools and Rs.10.00 in other schools."

A nationalist influenced by

#MOVIES



The film has steered a new movement in cinema as education, information and entertainment that has seen fruition in 15000 schools with 50,000 screenings, projected through DVD on a large screen with the help of volunteers who cut across boundaries of age, occupation, education, sex and social status.

Vinoba Bhave and Gandhiji, *Sane Guruji*, was imprisoned repeatedly for his work among the peasantry and participation in the Quit India movement. *Shyamchi Aai* has 45 episodes in which Shyam, a youth living in poverty in Konkan, recalls the teachings of his mother, a devoutly religious person with an earthy and practical philosophy. He wrote this book in five days while he was detained in jail for participation in the "Civil Disobedience movement." He was a sensitive man and a prolific writer.

Sane Guruji's childhood and his interactions with his mother, Yashodabai, are filled with myriad images of values imparted through discipline, reward and punishment. Shyam who is afraid of water, is thrust into the pond along with his brothers to make him learn to swim, much against his will. This scene carries resonances of *Ishwar Chandra Vidyasagar*, swimming across the flooded waters of Damodar River, to reach his mother on the other side. Later, Shyam tells his mother how swimming helped him come home on a stormy night across

flooded waters. Once, Shyam steals one rupee from his uncle's shirt pocket. When his mother is humiliated by the uncle and his wife, Shyam confesses that he has, indeed, stolen the money. His mother beats him up and then forces him to promise that he will never do it again. Later, when they have become very poor, his friends taunt him about the straw-thatched hut they live in. He says, "We may be poor but we are rich in heart." His mother asks him who taught him such beautiful thoughts. "It was you, mother," says Shyam and hides his face in his mother's sari.

Shyam is a normal, naughty boy, full of mischief and playfulness. But his father's teachings instill in him strong patriotic feelings. He idolizes *Bal Gangadhar Tilak*, who is imprisoned for six years, during the time setting of the film. There is a scene where, while taking lunch, Shyam's mother asks how the cooking was. Her husband says, "Very good" and Shyam echoes his father's comment. The others follow suit. When Yashodabai tastes the dish herself, she finds that she has for-

gotten to add salt. She feels guilty and surprised at the same time. This is a pointer to the feelings of solidarity within a family driven to the edges of poverty.

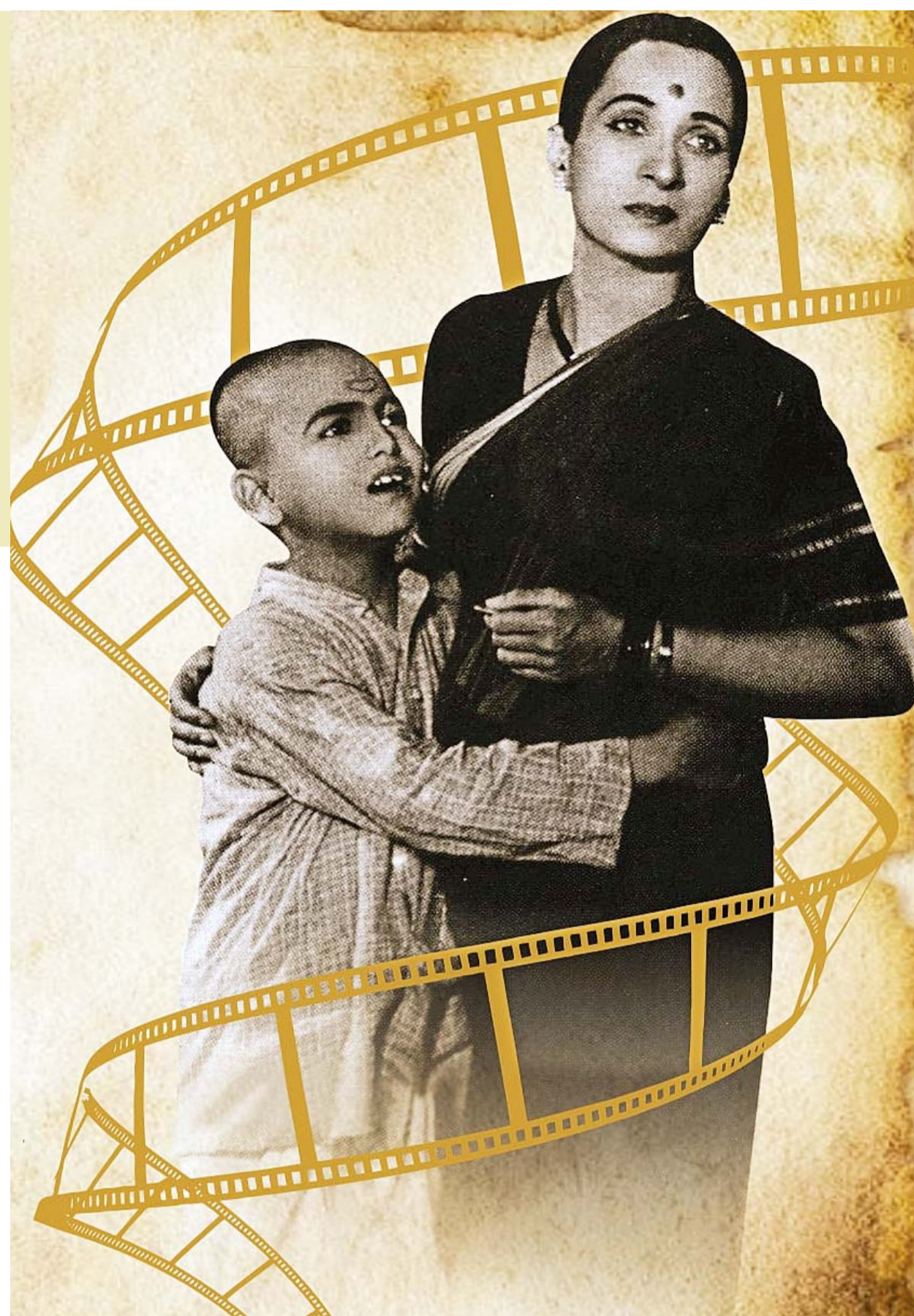
Subhash Chheda made the DVD and VCD versions available at a modest price. At that time, he hardly imagined the impact that this film would make on three generations of people in Maharashtra. People came forward to volunteer for the screening of the film at schools in small towns and villages in Maharashtra. The film has steered a new movement in cinema as education, information and entertainment that has seen fruition in 15000 schools with 50,000 screenings, projected through DVD on a large screen with the help of volunteers who cut across boundaries of age, occupation, education, sex and social status.

Atre brought the story to life on screen with *Madhav Vaze* as Shyam and *Vanamala*, in the title role, as Shyam's mother. Other actors were Umesh, Balurao Pendharkar and Sumati Gupta. Madhav charms everyone with his sparkling performance, expressing the range of emotions with openness a child is prone to. Vanamala, as the mother, is a picture of dignity a woman of her time who values her husband much above anything else in life. The film transports us to a world, where all the problems in life are faced with a positive attitude and a deep faith in God. Vanamala, a



Ginuary

Start the year out, with a dedication to a rather unique and versatile spirit, that is sophisticated and also delicious. Gin is a spirit, having a rich and unique history that begins in Europe. Originally used for its medicinal effects, the name may have come from a Flemish word "genever" or "jenever" and then, it was likely shortened to simply become "gin", as it is known today. It is made from a distilled grain as well as berries from the coniferous juniper shrub and other botanicals.



In a world fractured by communal conflicts and ethnic disharmonies, where films like *My Name is Khan* and *3 Idiots* can get their messages across, only through violence in its varied manifestations, *Shyamchi Aai* takes today's children to a world where love sustains within poverty, humiliation, betrayal and oppression.

graduate from Pune, who taught in a school before entering films, was a staunch nationalist, deeply involved in the freedom movement along with Aruna Asaf Ali and Achyut Patwardhan. She was a member of the Chhatrapati Shivaji National Memorial Committee. She also ran a school to train children in traditional Indian arts and culture, *Haridas Kala Sanshan*. She was a noted actress of Hindi and Marathi films for two decades.

"It is a deeply moving, inspirational and educational film. It has relevance in today's world, where material greed and consumerism have almost replaced emotions like love and generosity, where a son even turns on his mother for money. It should be compulsory viewing to divert children, exposed to the materialism of modern society towards the real values of life, love and respect for parents, honesty, integrity and hard work," said the senior most volunteer of the *Shyamchi Aai* movement, Prakash bhai Mohadikar, who passed away some time ago, well into his nineties. Mohadikar of *Sane*

relevance can be traced to the positive feedback that it is bringing from the younger generation. Children of primary schools watch the film with their mothers. Nostalgic old men, who have seen the film, years ago, are buying DVD copies for their grandchildren. Young men, who have seen the film when they were children, want their children to watch the film. "In a world fractured by communal conflicts and ethnic disharmonies, where films like *My Name is Khan* and *3 Idiots* can get their messages across, only through violence in its varied manifestations, *Shyamchi Aai* takes today's children to a world where love sustains within poverty, humiliation, betrayal and oppression. It upholds motherhood through the character of Shyam's mother after whom the film is titled. It harps on the importance of honesty, integrity and unity, values decadent in the strife-stricken world, we live in," says Chheda.

Highlighting a mother's unconditional love for her child, the film brings to life the saying "Svami tini jagacha pan Aai vina bhikari." Roughly translated, it means, "You may be the greatest person in this universe but you are only a beggar without a mother." Meanwhile, Telugu newspaper, Andhra Jyoti also held screenings of the film with English subtitles in various cities of the state.

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Shyamchi Aai's contemporary
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#COOKING TIPS

Creative Ways To Use Melted Ice Cream

You can repurpose your melted ice cream for some other culinary endeavour

Settling down after a hard day at the office, running around with the kids or going through errands, really necessitates a mental reprieve that can be fulfilled by only one thing: *ice cream*. But, when you inevitably get called to do something else and have to put your favourite pint of ice cream down, you'll have to face the unfortunate fate of a melted serving.

Your first inclination might be to pop your ice cream back in the freezer. You should think twice about refreezing melted ice cream because it will produce a dense cream with an icy consistency.

Instead, you can repurpose it for some other culinary endeavour. As ice cream aficionados, we've played with the flavours and textures of melted ice cream to find applications that can elevate, both, the taste and texture of other dishes. Here are some of our favourites.

Turn it into easy fudge



You can turn melted ice cream into quick *fudge* by adding melted *sweetest chocolate chips* to a bowl and mixing them together. Once the ingredients are well combined, pop them into a lined tray and allow the candy to harden at room temperature for several hours. Depending on your preferences, you can also add pieces of nuts, marshmallows or chocolate into the candy, before it sets for a bit crunchy.

Soak your French toast in it



French toast is a classic breakfast dish that always comes comfort and deliciousness. Melted ice cream is the secret to a better *French toast* because it has tons of sweetness, flavour and fatty qualities that will replace the ingredients already in the dish. And when you think about it, a custard-based ice cream already has the egg, cream and vanilla found in a good *French toast custard*, so, the swap is relatively easy.

Add it as a filling to your layer cake

We're always looking for simple yet elegant fillings for our layer cakes. Ice cream and *fruit curd* are a great combination for the inside of your cake because it's highly versatile and can be made with whatever fruit (and ice cream) that you have in your kitchen. When the curd, which is made by cooking fruit juice, zest, eggs, butter and sugar into a thick spread, is combined with melted ice cream, it resembles a soft sorbet popping with flavour and creamy elements.

Pour it into your coffee

We're not talking about *coffee ice cream* as a flavour. Rather, this hack is specific to adding a scoop of your favourite not-so-frozen delight to your cup of coffee in the morning. Unlike ice, adding melted ice cream won't dilute the flavour of your coffee. It also makes up for the cream and sugar that you would have to add to your beverage. This *affogato*-like beverage will change how you think of your favouriteiced or hot beverage.

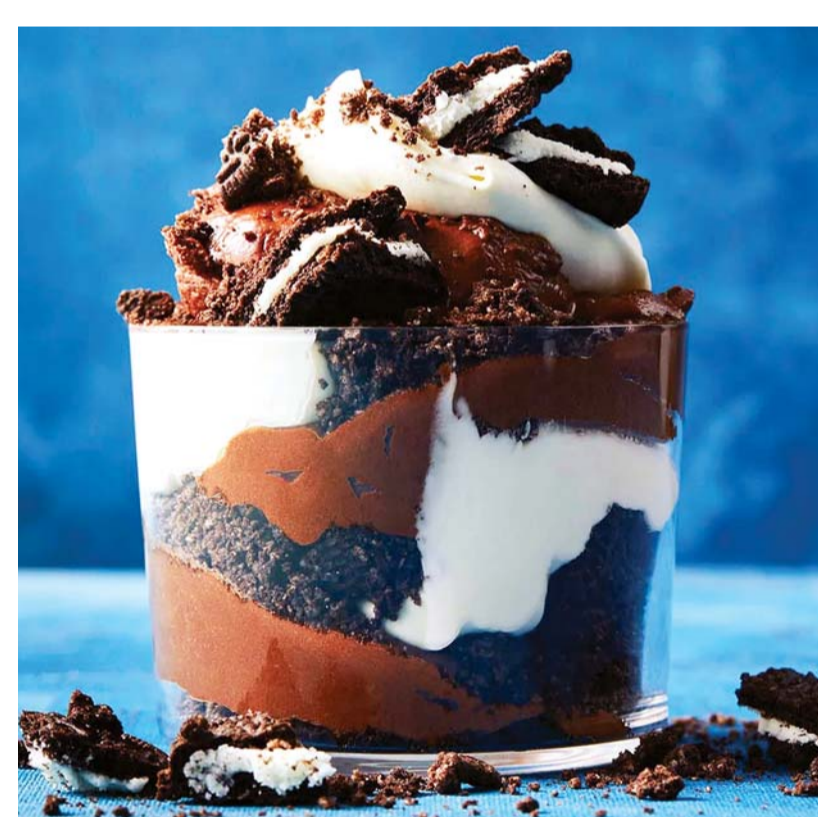
Complement your hot chocolate

A hot chocolate is our go-to beverage on a cold winter day. But we guarantee that you'll leave your boring hot chocolate behind, when you hear *this ice cream hack*. Adding ice cream to your hot chocolate will make your beverage extra creamy and help temper your beverage so that it's cool enough to sip on. Mix your melted ice cream with your cocoa powder and dilute with a splash of steamed milk as needed.



Use it as a burger topping

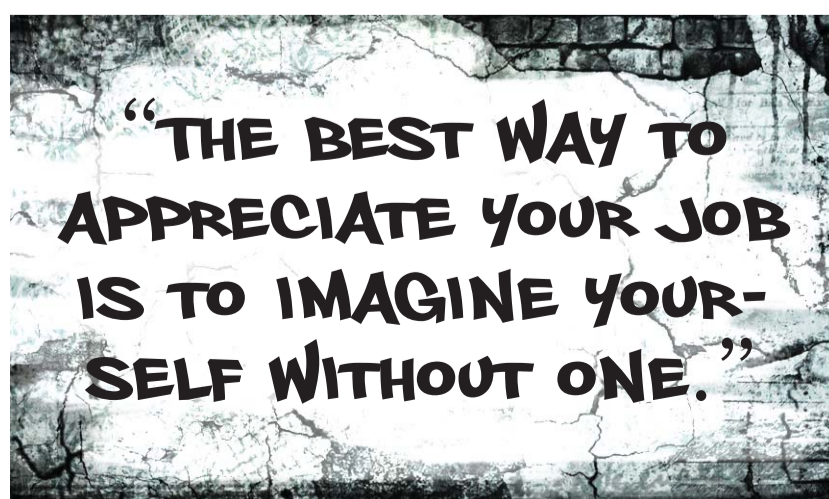
You should give ice cream a chance as a *burger topping* because it can enhance your burger's *umami* and *savory* flavours and toppings. It's also particularly good at balancing out astringent and spicy toppings that would otherwise overwhelm the sandwich. Although it might seem unconventional, this ingredient could take your burger to the next level.



Use it to make a mousse

Mousse is a creamy, pudding-like dessert that most people only get to eat at fancy restaurants. But with melted chocolate ice cream, you can make an easier *mousse* at home. You'll only need to gather a few ingredients including melted ice cream, heavy cream and cocoa powder. Dissolve the cocoa powder or chocolate pieces in the ice cream before folding in the whipped heavy cream. It's critical to get the heavy cream at the perfect texture, so that it gives the *mousse* a light mouthfeel.

THE WALL

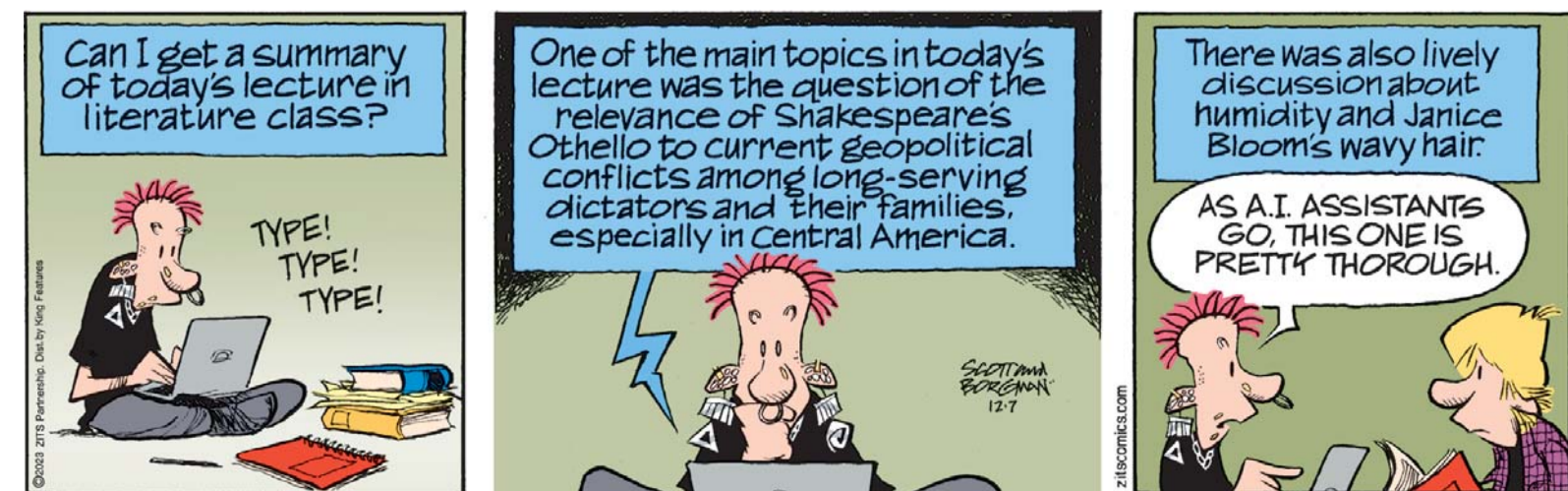


BABY BLUES



By Rick Kirkman & Jerry Scott

ZITS



By Jerry Scott & Jim Borgman

