American Cetacean Society – Monterey Bay Chapter PO Box H E, Pacific Grove, CA 93950

## Monthly meeting at Hopkins Marine Station, Lecture Hall Boat Works Building (Across from the American Tin Cannery Outlet Stores) Meeting is open to the Public

Thursday, March 29, 2018 Time: 7:30 PM

PLEASE JOIN US AT 7:00 PM FOR REFRESHMENTS

Speaker: Dr. Gitte McDonald

Title: Emperors Of The Ice

As a physiological and behavioral ecologist, Dr. Gitte McDonald investigates adaptations that allow animals to survive in extreme environments. Marine mammals and birds provide an ideal study system to investigate how animals deal with extreme conditions because of their large size variation, geographic distribution and physiological challenges they face on a daily basis including hypoxia, extreme temperatures, and fasting. Understanding the mechanisms that allow an organism to interact and survive in its environment is crucial for predicting, and potentially mitigating, their response to climate change. Currently her research program focuses on two broad areas of research: 1) determining the diving capacity of breath-hold divers and understanding the underlying mechanisms, and 2) determining the energetic requirements of foraging and reproduction to better understand energy allocation, physiological trade-offs, and the organism's role in the ecosystem. Dr. McDonald earned her Ph.D. in Ecology and Evolutionary Biology from UCSC, and joined the faculty at Moss Landing Marine Labs in 2015.

Join Gitte McDonald as she talks about her research expeditions to the Ross Sea to study the ecology and physiology of emperor penguins. Emperor penguins are the largest species of marine bird, and are able to fast longer, dive deeper, and endure harsher conditions than any other avian species. As a top predator in the Antarctic ecosystem, they have a significant top-down effect on prey. Additionally, as top predators, their survival and reproduction depends on the functioning of the entire food web. She will discuss the basic biology and ecology of emperor penguins, her current research on the behavioral and physiological adaptations that allow them to thrive in the Antarctic ecosystem, and current and future challenges.

**Please join** us for refreshments before the program begins. More information is available on our website, www.acsmb.org.

**Next month:** Our next meeting will be on Thursday, April 26 at Hopkins Marine Station. Please save the date and join us!

#### **MARCH 2018**

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#### ACS Monterey Bay chapter needs you!

Please consider volunteering to serve on the ACS Board of Directors. Current openings include Membership Chair and Publicity Chair.

If you enjoy learning about whales and sharing your passion with others, we'd like to speak with you. Please contact any board member for more information.

# AMERICAN CETACEAN SOCIETY Monterey Bay Chapter

## *Soundings* CALENDAR

**Mar. 8-11:** 15<sup>th</sup> Annual International Ocean Film Festival (IOFF) at Cowell Theater, San Francisco, CA. The biggest festival of its kind in North America, featuring dozens of ocean-themed films by independent filmmakers from around our Blue Planet.

**Mar. 18:** Science Sunday at the Seymour Center in Santa Cruz. Collecting Evolution: The Galapagos Expedition that Vindicated Darwin. Join Mathew James as he tells the story of the 1905-06 Galapagos Expedition. 1:30-2:30 PM.

**Mar. 22:** Seminar at Moss Landing Marine Lab by Ryan Kempster of the University Of Western Australia: Repelling Sharks to Save Them... and Us! 4 PM.

**Mar. 24:** Global Oceans Awards Gala Honoring Gary Griggs, distinguished professor of Earth and Planetary Sciences at UC Santa Cruz. 6 PM on the UCSC Campus.

**Apr. 15:** 2018 Annual Oceans Colloquium at Moss Landing Marine Labs. "Rising Ocean Leaders." Colloquium will include keynote speakers, Ted-Style Talks and interactive demonstrations. Sunday, 9 AM – 4:30 PM.

Apr. 28-29: Moss Landing Marine Lab Open House from 9 AM - 5 PM. Open house itinerary will include seminars, field trips, marine lab demonstrations, arts and crafts and puppet shows.

**May 3:** Seminar at Moss Landing Marine Lab by Dr. James Watanabe of Hopkins Marine Station: Up, Down and Sideways: Four decades of change in a Monterey Kelp Forest. 4 PM.

# BOOK RECOMMENDATIONS

<u>Traveling With Ghosts: A Memoir</u>, by Shannon Leone Fowler. 2017 Simon & Schuster.

Sapiens: A Brief History Of Humankind, by Yuval Noah Harari. 2015 Harper.

The Omega Principle: Seafood and the Quest for a Long Life and a Healthier Planet, by Paul Greenberg. 2018 Penguin Press.

On March 3rd, 2018, one of our beloved board members, Art, passed away. He was an integral part of our ACS Monterey Bay Board and he will be greatly missed. We will remember our board meetings at his house in Carmel fondly. It was always so lovely to watch the sunset over the ocean and overlook Carmel Bay while preparing for the next round of events and grants. There were many laughs shared at his table. Art was very instrumental in the grant giving process for ACS, and it brought him great joy to help local students secure funding for their various projects. Art was always on adventure! He usually had us captivated while recounting his latest trip or diving excursion as well as sharing his plans for his next adventure. He was a true reminder to live life to the fullest. We will remember him fondly as an ocean enthusiast and advocate, an artist and photographer, and as a great friend. We hope you are diving the best reefs in the world on the other side. Rest in peace dear friend.







#### DECLINE IN KRILL THREATENS ANTARCTIC WILDLIFE, FROM WHALES TO PENGUINS

#### By Matthew Taylor

Feb. 14, 2018 — The Antarctic, one of the world's last great wildernesses and home to animals such as whales, penguins and leopard seals, is being threatened by the plight of an animal just a few centimetres long, according to scientists.

Researchers and environmental campaigners warn that a combination of climate change and industrialscale fishing is threatening the krill population in Antarctic waters, with a potentially disastrous impact on larger predators.

A study co-authored by George Watters, lead scientist for the US government delegation to the Antarctic decision-making body Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR), warns that the penguin population could drop by almost a third by the end of the century due to changes in krill biomass.

"You could potentially have some significant decline in the number of predators – particularly for penguins – caused by climate change," said Watters.

The report, published in the journal Plos One, warned that climate change could reduce krill size by up to 40% in some areas of Antarctica's Scotia Sea causing a drastic reduction in predator numbers.

Researchers also said that current permitted rates of krill fishing "increased the risk for depletion of some predator populations" although it had "less impact than ocean warming".

"I am not advocating removing fishing entirely from Antarctic waters," said Watters. "People that make management decisions just need to be aware that you can still have an impact on predator populations by managing the krill fisheries more effectively."

Krill are a key part of the delicate Antarctic food chain. They feed on marine algae and are a key source of food for whales, penguins and seals. They are also important in removing the greenhouse gas carbon dioxide from the atmosphere by eating carbon-rich food near the surface and excreting it when they sink to lower, colder water.

Prof Alex Rogers, who is a specialist in sustainable oceans at the Oxford Martin School, Oxford University, said: "Climate change is having an impact [on the krill population] at the same time as a resurgence in krill fishing, with increasing numbers of fishing vessels and changes in technology that are causing increasing krill catches."



Antarctic food web, providing food for fish, whales, seals, penguins, albatross and other seabirds, as well as marine invertebrates. (Credit: Christian Åslund/Greenpeace).

Krill populations have declined by 80% since the 1970s. Global warming has been blamed for part of that decrease because the ice that is home to the algae and plankton they feed on is retreating.

Campaigners say recent developments in fishing technology are exacerbating the problem, allowing 'suction' harvesting by large trawlers, which are now able to gather up vast quantities of krill.

These fishing fleets are feeding a growing global demand for krill-based health products which are claimed to help with a range of ailments from heart disease to high blood pressure; strokes to depression.

A recent analysis of the global krill industry predicted it was on course to grow 12% a year over the next three years.

In response, a global campaign has been launched to turn a huge tract of the seas around the Antarctic into the world's biggest sanctuary, protecting wildlife and banning all fishing.

The 1.8m sq km reserve would cover a vast area of the Weddell Sea and a small part of the Antarctic Peninsula, and is one of three proposed new sanctuaries under consideration by CCAMLR.

The idea was originally put forward by Germany and is now supported by the EU. A decision is likely to be made at a CCAMLR conference in October.

Last month, Greenpeace launched a campaign in support of the sanctuary.

Will McCallum of the group's Protect the Antarctic Campaign said the report underlined that the area already faced "multiple threats", adding it did not need "additional strain" from krill fishing.

"Whether it's fishing near penguin foraging grounds around the Antarctic Peninsula and the East Antarctic, or their expansion plans for the vast and pristine Weddell Sea, the krill industry needs to know

that the Antarctic is not theirs to exploit, but all of ours to protect."

Andrea Kavanagh, director of the Pew Charitable Trust's Protecting Antarctica's Southern Ocean campaign which funded the latest study, said the findings showed the importance of creating a network of sanctuaries.

"This study shows that, with more urgency than we previously thought, we need to get these marine protected areas in place and they need to be "no take" – they have to be fully protected areas."

But Cilia Holmes, sustainability director at Aker BioMarines, one of the leading krill fishing companies based in Norway, said there was "no sound scientific evidence that the krill fishery poses a threat to the Antarctic ecosystem".

Krill fishing, she said, was already strictly regulated by the Antarctic nations with the total krill catch making up just 0.4% the estimated krill biomass in the area around the peninsula.

Holmes added that "protecting the Antarctic ecosystem" was critical to Aker BioMarines long-term operation.

"We believe in a future where there still is room for well-managed fisheries that take care of the surrounding ecosystem."

Dr. Susie Grant, from British Antarctic Survey, and part of the UK delegation to CCAMLR, said BAS scientists and the UK government were fully in favour of the new protected area in the Weddell Sea but said there remained a case for carefully managed, sustainable fishing in some Antarctic waters.

"While some parts of the Southern Ocean require a higher level of protection, it makes sense to allow sustainable and responsible fishing in areas where we know the risks are low and it can be managed effectively."

She added: "If a system of scientifically sound reserves can be established to protect Antarctic marine ecosystems, this will send a strong signal as to how we might manage and protect the oceans globally." https://www.theguardian.com/environment/2018/feb/14/dec line-in-krill-threatens-antarctic-wildlife-from-whales-to-penguins

### A MEAL WITH MAMMALS FROM SPACE

By Mary Lide Parker

Feb. 24, 2018 — The laws of physics dictate that the bigger you get, the less maneuverability you have.

Yet the biggest animal on earth — the blue whale can do a 360-degree barrel roll. "Sometimes they do a 180 pitch flip — and they can do it in sync with each

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other," says Jeremy Goldbogen, a marine physiologist at Stanford University. "The scope of their behavioral maneuverability is incredible."

"We joke that these guys are from space because they're totally crazy," Goldbogen says. "They have huge feeding sacks and unique jaws that no other mammals have."

Blue whales also have an alien-like tongue that can invert itself, allowing the entire area from the whale's mouth to its belly button to expand. This oropharyngeal cavity (or feeding pouch) is encased in ventral groove blubber. While many other cetaceans have stiff blubber, this accordion-like tissue has the unique ability to expand enough for the blue whale to engulf one and a half times its body mass.

Goldbogen's research includes analyzing videos of blue whales feeding (recorded via suction cup tags that adhere to a whale's back for roughly 24 hours.)

Now, as part of a research team in Antarctica, Goldbogen hopes they can find and tag enough minke whales to learn as much as he and his colleagues currently know about blue whales.

While the largest mammal on earth can engulf up to 150 percent of its body mass, little minkes can only gulp 20 to 60 percent. But what they lack in mass, minkes make up for in speed and efficiency—they can lunge, filter, and reload much quicker, taking six or seven gulps in a minute.

So it comes down to quantity over quality – minkes take more, smaller bites, and blue whales take fewer, larger bites. But both species face a precarious balancing act between energy exertion and consumption.

"If they take a big gulp and swallow more krill,



All baleen whales are considered filter feeders, but their specific methods vary. (Credit: Alex Boersma).

they may get more energy," Goldbogen says. "But their ability to stay under water may be reduced."

For humans, accustomed to stuffing ourselves while sitting at a table or vegging out on the couch, it may be hard to comprehend that eating a meal could be a highly aerobic activity. Imagine jumping into a pool, swimming as fast as you can, and opening your mouth to suck down a bunch of shrimp—all on one breath of air.

Whales are obviously better built for this activity, but they're still mammals functioning on limited oxygen reserves while exerting huge amounts of energy.

"It's like doing suicide sprints while holding your breath," Goldbogen says.

When it comes to the biomechanics of whales, balancing energy exertion versus consumption is one of the major questions.

"These are the biggest animals that have ever lived and we have no idea how much energy they need," says Dave Cade, a PhD student in Goldbogen's lab and another member of the research team in Antarctica.

"We try to calculate how much energy they're using based on the amount of movement, and the physics of how they move," Goldbogen says. "Can we refine those measures and improve our estimates?"

That will be one of the goals over the next two weeks.

https://medium.com/in-search-of-minkes/a-meal-withmammals-from-space-a6a3c236d423

#### TRACKING DATA REVEAL THE SECRET LIVES OF MARINE ANIMALS

Feb. 26, 2018 — The movements of marine mammals and other large animals that spend their lives in the ocean were largely unknown prior to the development of sophisticated tracking devices researchers could deploy on animals in the wild. Insights gained from this technology have revealed unexpected behaviors and migratory patterns in marine animals ranging from sharks and seals to turtles and albatrosses.

Researchers from around the world have now pooled their data on the movements of a wide array of marine animals, enabling them to look for common features in how animals move throughout the world's oceans. The results, published February 26 in *Proceedings of the National Academy of Sciences*, show remarkable convergence in the movement patterns of different species, even those widely separated by geography, phylogeny (evolutionary history), or mode of travel.

The biggest differences were between different habitats rather than between different species. In coastal areas, tracking tags revealed complex movement patterns dominated by search behavior, while in the open ocean they showed simpler, more predictable movements over longer distances.

"It makes sense, because the coast is a much more complicated environment, whereas the open ocean is more homogeneous and the features are more spread out in space and time," said coauthor Daniel Costa, a distinguished professor of ecology and evolutionary biology at UC Santa Cruz. "Regardless of what species it is, the movement patterns match the oceanographic features of their environment."

These insights can be useful, he said, for understanding how marine life will respond to climate change and for predicting the movements of species for which tracking data are lacking. "Many of these species are endangered and we have no tracking data, but we can extrapolate from other species to understand how they are likely to interact with fisheries, shipping, or other human activities," Costa said.

Costa has been at the forefront of developing hightech tracking devices and using them to study marine animals. UCSC's Long Marine Laboratory is known as a leading center for research on marine vertebrates, including seals, sea lions, sea otters, dolphins, and whales. The coauthors of the *PNAS* paper include six other UC Santa Cruz researchers in addition to Costa.

"This paper is the result of a big international effort. We realized that if we all share our data and work together in a concerted manner, we can learn a lot more about these animals," he said.

Costa and other UCSC researchers deployed the first satellite tracking tags on elephant seals at the Año Nuevo rookery north of Santa Cruz in the 1990s. The initial results were astonishing.

"Before we put tags on elephant seals, all the books said they were limited to the California Current. We had no idea they were traveling these incredible distances and using the entire North Pacific Ocean," Costa said. "We went from studying them where we could watch them to having the animals tell us where they were going."

In 2000, Costa joined forces with Barbara Block at Stanford University and others to launch the Tagging of Pacific Predators (TOPP) program, a decade-long effort to track the movements of top marine predators in the Pacific Ocean. Costa oversaw the tracking of

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The black-footed albatross is among the many marine species researchers have been able to track using satellite tags. (Credit: Dan Costa).

marine mammals, birds, and turtles for TOPP, which also included tracking of sharks and tunas.

Costa's lab has carried out groundbreaking tracking studies of a wide range of species around the world, including albatrosses, sooty shearwaters, California sea lions, Galapagos sea lions, crabeater seals, Weddell seals, and southern elephant seals. Meanwhile, his team has continued to learn new things about elephant seal biology from ongoing studies of the northern elephant seals at UC's Año Nuevo Natural Reserve.

One recent study, published February 14 in Biology Letters, revealed the effects of pregnancy on the diving behavior of female elephant seals. Led by postdoctoral researcher Luis Huckstadt, the researchers found that the dives of pregnant seals became shorter, probably due to an increasing demand for oxygen for the fetus.

"The only way we could do that is because we now have over 500 tracks of female elephant seals, and a small number of them didn't have a pup or lost it at sea, so we could compare and see the effects of pregnancy. It's not surprising, but nobody had been able to document it," Costa said.

https://www.sciencedaily.com/releases/2018/02/180226 152712.htm

# WHY DON'T YOU SEE PEOPLE-SIZED SALMON ANYMORE?

By Mary Lide Parker

Feb. 27, 2018 — While the orcas of Puget Sound are sliding toward extinction, orcas farther north have been expanding their numbers. Their burgeoning hunger for big fish may be causing the killer whales' main prey, chinook salmon, to shrink up and down the West Coast.

Chinook salmon are also known as kings: the biggest of all salmon. They used to grow so enormous that it's hard to believe the old photos now. Fishermen stand next to chinooks almost as tall as they are, sometimes weighing 100 pounds or more.

"This has been a season of unusually large fish, and many weighing from 60 to 70 pounds have been taken," the Oregonian reported in 1895.

"It's not impossible that we see individuals of that size today, but it's much, much rarer," University of Washington research scientist Jan Ohlberger said on Monday, more than a century later.

Ohlberger has been tracking the downsizing of salmon in recent decades, but salmon have been shrinking in numbers and in size for a long time. A century's worth of dam building, overfishing, habitat loss and replacement by hatchery fish cut the average chinook in half, size-wise, studies in the 1980s and 1990s found.

The dam building and fishing have tailed off, but chinooks have been shrinking even faster in the past 15 years, according to a new paper by Ohlberger and colleagues in the journal Fish and Fisheries. Older and bigger fish are mostly gone.

Few fish are making it to old age, which for a chinook salmon means spending five or six years in the ocean after a year or two in freshwater. "The older fish, which normally come back after five years in the ocean, they come back earlier and earlier," Ohlberger said.

The trend is clear, the reasons less so.

Two species eat more chinook salmon than any others: orcas and humans.

The 2,300 or more resident killer whales in the Northeast Pacific Ocean eat about 20 million pounds of chinook salmon a year – roughly equal to the annual commercial catch of chinook in recent years, according to the new study.

"There is a large number of resident killer whales out there that really target chinook, and they target the large chinook," Ohlberger said.

A study from federal researchers in November found that orcas' consumption of chinook salmon in the Northeast Pacific Ocean has doubled since 1975, surpassing humans' catches, which have fallen by a third over that time.

"As far as we can see, the killer whales are taking the older and bigger fish," said Craig Matkin, a whale researcher with the North Gulf Oceanic Society in Homer, Alaska. Matkin, who was not involved in Ohlberger's paper, studies Alaskan orcas' diets.

#### Soundíngs

"We go along with the animals and scoop up fish scales and bits of flesh from where they kill something," Matkin said. "They're sloppy eaters."

"They're going to go for the biggest, oiliest fish there are," Matkin said. "That's chinooks."

Salmon born in Oregon and Washington spend most of their lives out at sea, often in Alaskan waters, where orcas aplenty await.

"Our [orca] populations have increased faster than anywhere else, and they're eating chinook from all over the place," Matkin said.

In short, it seems Puget Sound orcas are having their lunch stolen by their better-off Alaskan relatives.

"It is an interesting twist to blame the marine mammals," Ken Balcomb with the Center for Whale Research on San Juan Island said in an email. "I would first ask how the chinook evolved to be so big during the preceding 12,000 years in the presence of hordes of such size-selective natural predators throughout their range. Large size was selected by Mother Nature for chinook salmon in spite of natural predation."

Balcomb points to overfishing, habitat loss and salmon hatcheries that have diluted the gene pool of wild chinooks.

Today's smaller chinook salmon lay fewer eggs than bigger ones can. They also have a harder time digging out gravel nests deep enough to protect their eggs from scouring streamflows.

Chinooks' downsizing could spell trouble for all the mammals who want to catch them, whether they have fingers or fins.

"Predators are also going to adapt to this change in size and numbers," Matkin said. "You can't look at it as a static situation."

"Ultimately, the whales must eat to survive, and humans have not sufficiently allowed for that in their fisheries management calculations," Balcomb said.

http://kuow.org/post/why-don-t-you-see-people-sized-salmon-anymore

## SIGHTINGS

Sightings are compiled by Monterey Bay Whale Watch. For complete listing and updates see *http://www.montereybaywhalewatch.com/slstcurr.htm* 

Date	#	Type of Animal(s)		
	3	Gray Whales		
2/28 1:30 pm	4	Humpback Whales		
	60	Common Dolphins		
	3	Gray Whales		
2/28 10 am	6	Humpback Whales		
	60	Common Dolphins		
2/27 10 am	5	Humpback Whales		

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	9	Gray Whales		
2/26 10 am	1	Humpback Whale		
	60	Pacific White-sided Dolphins		
2/25.8 am	7	Gray Whales		
2725 0 am	5			
2/24 10 am	5	Humpback whates		
	50	Risso's Dolphins		
2/24.8	9	Gray Whales		
2/24 8 am	75	Risso's Dolphins		
2/23 11.30 am	4	Gray Whales mating		
2/25 11.50 am		Crew Wholes		
2/22.10	3	Gray whates		
2/23 10 am	2	Humpback Whales		
	1	Black-footed Albatross		
	13	Gray Whales		
2/21 1:30 pm	15	Use what is the second second		
1	Z	Humpback whates		
	1	Gray Whale		
2/20 10 am	2	Humphack Whales		
2/20 10 am	10	Harbor Dorpoise		
0/10.0	10			
2/18 8 am	7	Gray Whales		
	6	Gray Whales		
2/17 1:30 pm	12	Killer Whales		
1	40	Risso's Dolphins		
	2	Killer Whales		
	5 1			
2/17 8 am	1	Minke Whale		
2/17 0 um	130	Risso's Dolphins		
	25	Pacific White-sided Dolphins		
	9	Grav Whales		
2/16 10 am	2	Humpback Whales		
	11			
2/15 11:30 am	11	Gray whates		
<b>1</b> , 10 11100 am	300	Risso's Dolphins		
0/14/11/20	7	Gray Whales		
2/14 11:50 am	1	Steller Sea Lion		
	0	Course With a loss		
2/14 10 am	0	Gray whates		
	4	Killer Whales		
	14	Gray Whales		
2/13 1·30 pm	1	Humphack Whale		
2/15 1.50 pm	1	Plack footed Albetross		
	1	Diack-looted Albatioss		
2/11 10 am	24	Gray Whales		
	100	Common Dolphins		
2/10 8 am	20	Gray Whales		
	19	Gray Whales		
2/9 10 am	300	Common Dolphins		
2/8 10	200			
2/8 10 am	23	Gray whates		
2/7 1:30 pm	2	Gray Whales		
	400	Pacific White-sided Dolphins &		
		Northern Right-whale Dolphins		
	25	Grav Whales		
2/6 10 am	600	Decific White sided Dolphing		
	000	Facilie White-sided Dolphilis		
2/5 10 am	8	Gray Whales		
	2	Humpback Whales		
215 10 alli	1	Fin Whale		
	100	Pacific White-sided Dolphins		
2/4 10 am	28	Gray Whales		
	20	Villon Whales		
	8	Killer whales		
	1	Humpback Whale		
	1	Fin Whale		
	10	Gray Whales		
	4	Killer Whales		
2/3 1:30 pm	1	Humphack Whale		
	1	Humpback whate		
	400	Long-beaked Common Dolphins		

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Strandings / Entanglements / Distress 24-hour toll-free 877-767-9425

Harassment NOAA Enforcement, Monterey 831-853-1964

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Membership/Subscriptic	on Type:	New	Gift	Renewal				
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City, State, Zip								
Phone								
Membership Level								
Membership Levels and Annual Dues								
Lifetime \$1000	Patron	\$500	Contributing	\$250				
Supporting \$85	Interna	tional \$55	Family \$55	Family \$55				
Individual \$45	Studen	t \$35	Teacher \$35					
Senior (62 plus) \$35								
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