RODRIGO JOSÉ BOMBARDI

Department of Geography
College of Geosciences
Texas A&M University
3147 TAMU | College Station, TX 77843-3147.
MS 3147

Phone: (979) 458-1712
e-mail: rjbombardi@tamu.edu
web: www.rodrigobombardi.com

APPOINTMENTS

Assistant Professor, Department of Geography, College of Geosciences, Texas A&M University (Sep 2017 – present)

Postdoctoral Research Fellow, Department of Atmospheric, Oceanic and Earth Sciences. College of Science. George Mason University (Sep. 2013 – Aug 2017)**.**

EDUCATION

Doctor Degree in Geography (2009 - 2013)
Department of Geography - University of California, Santa Barbara (UCSB), United States of America
Title: The South Atlantic Coupled Variability and the South Atlantic Convergence Zone.
Advisor: Dr. Leila Maria Véspoli de Carvalho

Master Degree in Meteorology (2006 - 2008)
Institute of Astronomy, Geophysics and Atmospheric Sciences (IAG) - Dept. Atmospheric Sciences - University of São Paulo (USP), Brazil
Title: Variability of the South America Monsoon Regime: Present Climate and Projections for 21st Century
Advisor: Dr. Leila Maria Véspoli de Carvalho. Sponsor: FAPESP/Brazil

Bachelor of Sciences in Meteorology (2001 - 2005)
Institute of Astronomy, Geophysics and Atmospheric Sciences (IAG) - Dept. Atmospheric Sciences - University of São Paulo (USP)

AWARDS

Graduate Division Dissertation Fellowship (UCSB Graduate Division, 2013)
Geography Excellence in Research Award (UCSB Department of Geography, 2013)
Award for Outstanding Poster Presentation (WCRP Open Science Conference, 2011)
Fellowship *Fundacao de Amparo a Pesquisa do Estado de São Paulo (FAPESP*, 2006-2008)
Undergraduate internship research fellowship *Conselho Nacional de Pesquisa (CNPq*, 2004-2005)
Travel support awards to attend meetings (ESF-LFUI Research Conference, Obergurgl, Austria, 2012; WCRP Open Science Conference, Denver, CO, 2011; MOCA-09, Montreal, Canada, 2009)

GRANTS FUNDED

2021:
Bombardi RJ, Woodfin S: Informal Geoscience Education using Comics and Graphic Novels: preliminary results for an NSF CAREER proposal. GeoDean's Disciplinary/Interdisciplinary Research Initiative Program. Seed funding ($6,000). PI Bombardi share: $6,000.

2020:
Frauenfeld O, **Bombardi RJ**, Wyatt B: Applications For Global Rainy And Dry Season Variability

T3: Texas A&M Triads for Transformation Round Four, Texas ($30,000.00). PI Bombardi share: $10,000.00

2018:

Bombardi RJ, Marengo, JA: Improving water and food security in South America through the prediction of the timing of the rainy season TAMU-FAPESP SPRINT ($7,064.00 from TAMU; $5,844 from FAPESP). PI Bombardi share: $7,064.00

Bombardi RJ, Wu X, Frauenfeld O: Predictability of The Timing of The Growing Season over Texas T3: Texas A&M Triads for Transformation Round One, Texas ($35,000.00). PI Bombardi share: $25,000.00

EXTERNAL GRANTS SUBMITTED (PENDING)

Bombardi RJ,: CAREER: The future of the American monsoon systems. Submitted (July 26, 2021) to NSF Climate and Large-Scale Dynamics (CLD) ($597,211 for 5 years).

Bombardi RJ,: Local sources of variability of the timing of the North and South American monsoon systems. Submitted (June 21, 2021) to NASA Precipitation Measurement Missions (PMM) ($267,769 for 3 years).

PEER REVIEWED PUBLICATIONS (*, # INDICATES GRAD, UNDERGRAD STUDENT COAUTHORS)

Bombardi RJ and Boos WR (2021) Explaining globally inhomogeneous future changes in monsoons using simple moist energy diagnostics. *Journal of Climate*. 34 (21), 8615–8634. DOI: 10.1175/JCLI-D-20-1012.1

*Ford V, Frauenfeld OW, Nowotarski, C, **Bombardi RJ** (2021) Effective Sea Ice Area Based on a Thickness Threshold. *Clim Dyn*. 56, 3541–3552 DOI: 10.1007/s00382-021-05655-6

Bombardi RJ, Moron V, #Goodnight JS (2020) Detection, variability, and predictability of monsoon onset and withdrawal dates: A review. *International Journal of Climatology*. DOI: 10.1002/joc.6264

Bombardi RJ, Kinter JL, Frauenfeld OW (2019) A Global Gridded Dataset of the Characteristics of the Rainy and Dry Seasons. *BAMS*, DOI: 10.1175/BAMS-D-18-0177.1

Dirmeyer PA, Halder S, **Bombardi RJ** (2018) On the harvest of predictability from land states in a global forecast model. *Journal of Geophysical Research: Atmospheres*, 123, 13, 111-13, 127. DOI: 10.1029/2018JD029103

Bombardi RJ, Trenary L, Pegion KV, Cash B, DelSole T, Kinter JL (2018) Seasonal predictability of summer rainfall over South America. *Journal of Climate*, 31, 8181–8195, DOI: 10.1175/JCLI-D-18-0191.1

Bombardi RJ, Pegion KV, Kinter JL, Cash BA, Adams JM (2017) Sub-seasonal predictability of the onset and demise of the rainy season over monsoonal regions. *Frontiers Atmospheric Science*. DOI: 10.3389/feart.2017.00014

Bombardi RJ and Carvalho LMV (2017). Simple Practices in Climatological Analyses: A Review. *Revista Brasileira de Meteorologia.* 32 (3), 311-320 (in Portuguese)

Alvez LM, Marengo JA, Fu Rong, **Bombardi RJ** (2017) Sensitivity of Amazon Regional Climate to Deforestation. *American Journal of Climate Change*. DOI: 10.4236/ajcc.2017.61005

Bombardi RJ, Tawfik AB, Manganello JV, Marx L, Shin C-S, Halder S, Schneider EK, Dirmeyer PA, Kinter JL (2016) The heated condensation framework as a convective trigger in the NCEP climate forecast system version 2. *JAMES*, DOI: 10.1002/2016MS000668

Bombardi RJ, Schneider EK, Marx L, Halder S, *Singh B, Tawfik AB, Dirmeyer PA, Kinter JL (2015) Improvements in the representation of the Indian Summer Monsoon in the NCEP Climate Forecast System version 2. *Climate Dynamics*, 45, 2485-2498. DOI: 10.1007/s00382-015-2484-6

Bombardi RJ, Zhu J, Marx L, Huang B, Chen H, Lu J, Krishnamurthy L, Krishnamurthy V, *Colfescu I, Kinter JL, Kumar A, Hu Z-Z, Moorthi S, Tripp P, Wu X, Schneider EK (2015) Evaluation of the CFSv2 CMIP5 Decadal Predictions. *Climate Dynamics*. 44:543-557.DOI:10.1007/s00382-014-2360-9

Bombardi RJ, Carvalho LMV, Jones C (2014) Simulating the Influence of the South Atlantic Dipole on the South Atlantic Convergence Zone During Neutral ENSO. *Theoretical and Applied Climatology*, 118, 251:269. DOI: 10.1007/s00704-013-1056-0

Bombardi RJ, Carvalho LMV, Jones C, and Reboita MS (2014) Precipitation over Eastern South America and the South Atlantic Sea Surface Temperature during Neutral ENSO Periods. *Climate Dynamics*, 42, 1553-1568. DOI: 10.1007/s00382-013-1832-7

Bombardi RJ and Carvalho LMV (2011) The South Atlantic Dipole and Variations in the Characteristics of the South American Monsoon in the WCRP-CMIP3 Multi-Model. *Climate Dynamics, 36*, 2091-2102. DOI 10.1007/s00382-010-0836-9

Morales CAR, Rocha RP, and **Bombardi RJ** (2010) On the development of summer thunderstorms in the city of São Paulo: Mean meteorological characteristics and pollution effect. *Atmospheric Research, 96*, 477 – 488. DOI 10.1016/j.atmosres.2010.02.007

Bombardi RJ and Carvalho LMV (2009) IPCC Global Coupled Model Simulations of the South America Monsoon System. *Climate Dynamics, 33*, 893-916. DOI 10.1007/s00382-008-0488-1

Bombardi RJ and Carvalho LMV (2008) Variability of the monsoon regime over the Brazilian Savanna: the present climate and projections for a 2xCO2 scenario using the MIROC model. *Revista Brasileira de Meteorologia*, *23*, 58-72. DOI 10.1590/S0102-77862008000100007 (in Portuguese)

PUBLICATIONS SUBMITTED (*, # INDICATES GRAD, UNDERGRAD STUDENT COAUTHORS)

Santis W**, Bombardi RJ**, Castellanos P, Campos E (2021) The South Atlantic Subtropical Dipole Memory Effect and its Influence on extra-tropical cyclones in western South Atlantic. Submitted to Climate Dynamics.

Stoler J, Pearson AL, Rosinger AY, **Bombardi R**, Brewis A, Keough SB, Lee A, López-Carr D, Shrader C-H, Stauber C, Stevenson EGJ, Sullivan A, Tutu RA. (2021) The Role of Water in Environmental Migration. Submitted to WIREs Water.

INVITED BOOK CHAPTERS

Invited by the **World Meteorological Organization (WMO)** to contribute a chapter to the book "The Multiscale Global Monsoon System". This WMO-sponsored monsoon review book will be the fourth in the International Workshop on Monsoons series. Chapter reference: Moron V, **Bombardi RJ.** Hendon H, Marshall A, Sahai AK (2019) Monsoon Sub-seasonal Prediction.

Invited by the Indian Institute of Tropical Meteorology to contribute a chapter to the book "Current trends in the Representation of Physical Processes in Weather and Climate Models". Chapter reference: **Bombardi RJ**, Tawfik AB, Marx A, Dirmeyer PA, Kinter JL (2019) Convection Initiation in Climate Models using the Heated Condensation Framework: A Review.

INVITED TALKS

"Biases and future trends in the annual cycle of monsoon precipitation in global climate models" presented at the AOES Department at the **George Mason University** (December 2, 2020)

"Monsoon prediction: sub-seasonal to seasonal forecasts and climate change projections" presented at the Geography Department at the **University of Montreal**, Montreal, Canada (November 15, 2019) and at the CLIVAC group in the Geography Department at the **University of California, Santa Barbara** (October 2, 2020)

"Predictability of the South American summer rainfall" presented at the **American Meteorological Society Annual Meeting**, Austin, TX (January 11, 2018)

"The rainy season and the monsoon: sub-seasonal prediction and model development" **Seminar** presented at the MIT Atmospheric Sciences Seminar, **Massachusetts Institute of Technology**, Cambridge (November 4, 2016)

"Improvements in the representation of the Indian Monsoon in the NCEP Climate Forecast System version 2" Seminar at the Earth Research Institute, **University of California, Santa Barbara** (Jun 13, 2014)

COMPUTER TIME GRANTS

Schneider EK, Marx L, Kinter JL, DelSole T, **Bombardi RJ**: Evaluating and Improving Dynamical Decadal Climate Prediction
XSEDE Proposal for the TACC/Stampede Supercomputer, Texas (2.9 Million SUs allocated)

CONFERENCE PAPERS AND ABSTRACTS

Bombardi RJ, Trenary L, Emanuel K (2020) Predictability of a Genesis Potential Index. Oral presentation at the AMS Annual Meeting, Boston, MA (Jan 12-16).

Bombardi RJ (2019) A Global Gridded Dataset of the Timing and Intensity of the Wet and Dry Seasons. Oral presentation at the AMS Annual Meeting, Phoenix, AZ (Dec 6-11).

Bombardi RJ (2018) A Global Gridded Dataset of the Timing and Intensity of the Wet and Dry Seasons. Poster presentation at the AGU Annual Meeting, Washington, D.C. (Dec 10-14).

Bombardi RJ (2018) A Dataset of the Timing and Intensity of the Wet and Dry Seasons. Poster presentation at the AAG Annual Meeting, New Orleans, LA (Apr 7-14).

Bombardi RJ, Trenary L, Pegion KV, Cash BA, DelSole T, Kinter JL (2018) Predictability of the South American summer rainfall. Invited oral presentation at the AMS Annual Meeting, Austin, TX (Jan 8-11).

Moron V, **Bombardi RJ**, Hendon H, Marshall A, Sahai AK, and Chattopadhyay R (2017) Monsoon Sub-Seasonal Prediction. Invited oral presentation and extended abstract. Presented at the Sixth WMO International Workshop on Monsoons (IWM-VI). Singapore (Nov 13-17).

Bombardi RJ, Pegion KV, Kinter JL, Cash BA, Adams JM (2017) Sub-seasonal predictability of the onset and demise of the rainy season over monsoonal regions. Oral presentation at the AMS Meeting, Seattle (Jan 22-26)

Bombardi RJ, Tawfik AB, Marx L, Shin C-S, Schneider EK, Dirmeyer PA, Kinter JL (2016) The Heated Condensation Framework as a Convective Trigger in the NCEP Climate Forecast System version 2. Oral presentation at the AMS Annual Meeting, New Orleans (Jan 10-14)

Bombardi RJ, Tawfik AB, Marx L, Shin C-S, Schneider EK, Dirmeyer PA, Kinter JL (2015) Implementing a New Convective Trigger function in the NCEP Climate Forecast System version 2. Poster presentation at the CLIVAR workshop, GFDL, New Jersey (Oct 15-16)

Bombardi RJ, Schneider EK, Marx L, Halder S, Singh B, Tawfik AB, Dirmeyer PA, Kinter JL (2014) Improvements in the representation of the Indian Summer Monsoon in the NCEP Climate Forecast System version 2. Oral presentation at the AGU Fall Meeting, San Francisco (Dec 15-19)

Bombardi RJ, Carvalho LMV, and Jones C (2012) South Atlantic Sea Surface Temperature and its Relationship with Precipitation in Brazil during Neutral ENSO Periods. Poster presentation at the AGU Fall Meeting, San Francisco (Dec 3-7)

Bombardi RJ and Carvalho LMV (2012) The South Atlantic Dipole Events during ENSO Neutral Periods and Their Relationships with the Precipitation in Brazil. Poster presentation at the ESF-LFUI Research Conference: "Modes of Variability in the Climate System: Past-Present-Future", Obergurgl, Austria (May 27-June 1)

Bombardi RJ and Carvalho LMV (2011) The Impact of the South Atlantic Sea Surface Temperature on Summer Precipitation in Central-Eastern Brazil. Poster presentation at the WCRP Open Science Conference, Denver, USA (Oct 24-28)

Bombardi RJ and Carvalho LMV (2009) Sea Surface Temperature Patterns and Extreme Variations in the Characteristics of the South America Monsoon System: Observations and Simulations from the IPCC Global Coupled Models. Oral presentation at the MOCA-09, Montreal, Canada (Jul 19-29)

Bombardi RJ, and Carvalho LMV (2008) Sea Surface Temperature Patterns and Extreme Variations in the Characteristics of the South America Monsoon System: Observations and Simulations from the IPCC Global Coupled Models. Poster presentation at the XV Brazilian Conference of Meteorology, São Paulo, Brazil (Aug 24-29) (in Portuguese)

Bombardi RJ and Carvalho LMV (2007) Simulation of the monsoon regime over tropical South America in IPCC coupled models: the present climate and projections for a global change scenario. Poster presentation at the III Regional Conference on Global Change: South America, São Paulo, Brazil (Nov 4-8)

Bombardi RJ and Carvalho LMV (2007) Variability of the monsoon regime over Brazil in IPCC coupled models for the present climate. Oral presentation at the XV Brazilian Conference of Agrometeorology, Aracaju, Brazil (Jul 2-5) (in Portuguese)

Bombardi RJ and Carvalho, L. M. V. (2006) Variability of the monsoon regime over the Brazilian Savanna: the present climate and projections for a $2xCO_2$ scenario using the MIROC model. Poster presentation at the XIV Brazilian Conference of Meteorology, Florianópolis, Brazil (Nov 27- Dec 1) (in Portuguese)

Bombardi RJ and Carvalho LMV (2005) Precipitation Extremes during the Dry Season and Its Implications in the features of the Rainy Season over the Brazilian Savannah. Poster presentation at the XIV Brazilian Conference of Agrometeorology, Campinas, Brazil (Jul 18-21) (in Portuguese)

THESIS AND DISSERTATION ADVISOR

Chair: Yuyan Wang (MS, 2021)
Committee member: Osias Ruiz Alvarez (PhD), Nichole Casamassina (MS), John P. Cole (MS in Progress), Rhett Douris (PhD in progress), Victoria Ford (PhD in progress), Angela Khong (MS in progress), Lin Lin (PhD in progress), Jonathan D. Lasco (PhD in progress), Alex Smith (MS in progress)

UNDERGRADUATE RESEARCH ADVISOR

James Seth Goodnight (Summer 2018); Hannah Kirst (Fall 2018); Breeana Gonzalez (Spring 2019); Jack Howell (Summer 2019); Paige Wirth (Fall 2019 – Spring 2020); Kerry Abernethy (Spring 2020 - present).

Undergraduate Thesis Advisor (2021-2022AY): Kerry Abernethy. "Evaluating the impacts of climate change on the West African Monsoon"

TEACHING

Instructor of Record, Department of Geography, Texas A&M University

- GEOG 612 – Applied Climatology (graduate)
- GEOG 634/434 – Hydrology and Environment (graduate / undergraduate)
- GEOG 324 – Global Climatic Regions (undergraduate)
- GEOG 203 – Planet Earth (undergraduate)
- GEOG 213 – Planet Earth Lab (undergraduate)

Lectured for 15 weeks, managed six Teacher Assistants

Instructor of Record, Department of Geography, University of California, Santa Barbara

- GEOG 3A – Oceans and Atmosphere (Summer 2012).

Lectured for 6 weeks, managed one Teacher Assistant (20 h/week)

Teacher Assistant, Department of Geography, University of California, Santa Barbara

- GEOG 163 - Ocean Circulation (WInter 2010). Supervisor: Dr. David Siegel
- GEOG 110 - Introduction to Meteorology (Spring 2010). Supervisor: Dr. Leila M. V. Carvalho
- GEOG 133 - Tropical Meteorology (Fall 2010). Supervisor: Dr. Leila M. V. Carvalho
- GEOG 119 – Climate Change (Spring 2011). Supervisor: Dr. Joel Michaelsen

Lead weekly discussion sections, lectured for two weeks and graded assignments (20 h/week)

Teacher Assistant, Department of Atmospheric Sciences, University of São Paulo, Brazil

- Climatology II (Spring, 2006). Supervisor: Dr. Humberto R. Rocha
- Climatology II (Spring, 2008). Supervisor: Dr. Humberto R. Rocha

Prepared presentations and held office hours (6 h/week)

PROFESSIONAL SERVICE

SERVICE AT THE NATIONAL LEVEL

Chair (along with Dr. William Boos and Dr. Francina Dominguez) of conference session: Monsoons of the Americas: Variability and Predictability of Extreme Events. American Meteorological Society annual meeting, Phoenix, AZ (2019).
Panelist in Underrepresented Groups in Geography-Climatology Panel. American Association of Geographers Annual Meeting, Washington D.C. (2019).
Reviewer for the National Science Foundation (2017)
Director (elected) of the Climate Specialty Group Board of the American Association of Geographers (2021-present)
Member of the awards committee of the Water Resources Specialty Group of the American Association of Geographers (2018-2021)
Member of the American Meteorological Society's Committee on Climate Services (2016 – present)
Member of the American Meteorological Society's Board on Women and Minorities (2016 – 2019)

Reviewer for journal (AMS): Journal of Climate, Journal of Hydrometeorology, Journal of Applied Meteorology and Climatology
Reviewer for journal (AGU/Wiley): Geophysical Research Letters, International Journal of Climatology, Quarterly Journal of the Royal Meteorological Society, Atmospheric Science Letters
Reviewer for journal (Springer): Climate Dynamics, Climatic Change, Acta Geophysica
Reviewer for journal: Journal of Climatology, Revista Brasileira de Meteorologia, Atmosphere, Frontiers in Environmental Science, Climate Research

SERVICE AT THE TEXAS A&M UNIVERSITY

Coordinator of the course Planet Earth Lab (GEOG 213; Spring 2019 – present)
Academic for Future Faculty (AFF) **Mentor** for Angela Khong (Spring 2021)
Member of the Awards committee at the Department of Geography (Fall 2017 – present)
Member of the Diversity and Climate Committee at the College of Geosciences (Fall 2019 – present)
Member of the Search Committee for ACES fellows (Fall 2020 – Spring 2021)
Member of the Geography 50th Anniversary Committee (Fall 2019 - Spring 2020)
Mentor for the Atmospheric Sciences NSF REU program (Summer 2018)
Member of the GEOG 203 Ad-hoc Teaching Committee at the Department of Geography (Fall 2017)

SERVICE AT THE GEORGE MASON UNIVERSITY (SCIENCE OUTREACH)

Guest Lecturer at Medford High School, Medford, MA. Title: Prediction in the context of weather, climate, and climate change (May 18, 2017). Presented for 4 periods.
Organizer of the Earth Day Lightning Talks, GMU. A series of informal 3 min talks (April 26, 2017)
Organizer of the Earth Day Lightning Talks, GMU. A series of informal 3 min talks (April 20, 2016)
Organizer of the Climate Dynamics department's seminar at GMU. (Sep 2015 – Dec 2015)
Curator for the George Mason University twitter account @GeorgeMasonU (Mar 14 – 20, 2016)
Curator for the Real Scientists twitter account @realscientists (Nov 15 – 21, 2015)
Organizer of the Earth Day Lightning Talks, GMU. A series of informal 3 min talks (April 22, 2015)

SERVICE AT THE UNIVERSITY OF CALIFORNIA, SANTA BARBARA

Member, Geography Outreach committee, UCSB (Sep 2010 - Jun 2011)

PROFESSIONAL MEMBERSHIP

American Meteorological Society (AMS, since 2015)
American Association of Geographers (AAG since 2017)

SPECIALIZATION COURSES

"Leadership Development Program" lead by the North American Training and Development, Inc., College Station, USA (14-16 October, 2019)

"2018 NIH-NSF Grant Proposal Writing Program", College Station, USA (Jan–Apr, 2018).

"Summer Teaching Institute for Associates 2012", Santa Barbara, USA (May-Aug, 2012)

"The Weather-Climate Intersection: Advances and Challenges", Advanced Study Program (ASP) at the National Center for Atmospheric Research (NCAR), Boulder, USA (June 4-22, 2012)

"UCSB Grant Writing Institute, Santa Barbara, USA (Jun 13 – Jul 1, 2011)"

"Atmospherical Modeling using BRAMS" (Brazilian contributions to the Regional Atmospheric Modeling System - RAMS), Cachoeira Paulista, Brazil (Jul 21-Aug 1, 2008)

"Functional Biogeography of Tropical Vegetation", Brasília, Brazil (Apr 7-11, 2008)

"Workshop on the Interdisciplinary Science of Global Climate Change: Basic Elements", Buenos Aires, Argentina (Mar 12 - Apr 4, 2007)

"IAI-CPTEC Training Institute on Climate, Land Use and Modeling", Cachoeira Paulista, Brazil (Aug 13-18, 2006)

SPECIFIC SKILLS

- Programming Languages: Python, IDL, GrADS, FORTRAN 77/90/95, and shell-scripting
- Operational systems: Windows, UNIX /LINUX system, and Mackintosh
- Basic knowledge of HTML /CSS
- Fluent in Portuguese and English.

VOLUNTEER WORK

Big Brother at Big Brother and Big Sisters of Massachusetts Bay (Feb 2016 – Apr 2017)

Volunteer Teacher, Department of Atmospheric Sciences, University of São Paulo, Brazil

- Logical programming and FORTRAN language (Mar – Jun, 2009)
- Logical programming and FORTRAN language (Apr – Jul, 2008)

Created and taught the class for undergraduate and graduate students (6 h/week)

Volunteer Teacher, Preparatory courses for college, Campinas, Brazil

- High-school level Physics, TRIU project (Feb – Dec, 2004)
- High-school level Physics, CAS project (Feb – Dec, 2002)
- High-school level Physics, *Alcance* project (Feb – Dec, 2001)

The TRIU project started in 2004 and is still active. The project has been creating opportunities for low-income students to attend universities of quality in Brazil and have been providing teaching opportunities for undergraduate students (4 h/week).

REFERENCES

Dr. Oliver W. Frauenfeld, oliver.frauenfeld@tamu.edu
Dr. James L. Kinter III, ikinter@gmu.edu
Dr. Leila M. V. Carvalho, leila@eri.ucsb.edu
Dr. Charles Jones, cjones@eri.ucsb.edu

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