

रससाङ्ख्य

Rasasāṅkhyā

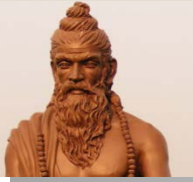
Connecting Rasa to Sāṅkhyā via Neuroscience

**Bijoy M Misra<sup>1</sup>, Prem S Nagar<sup>2</sup>,  
Bela Kosaras<sup>3</sup> and Jaspal Singh<sup>4</sup>**

Affiliations: <sup>1</sup>Harvard University, <sup>2</sup>Oracle Corporation,

<sup>3</sup>Harvard Medical School, <sup>4</sup>South Asia Center

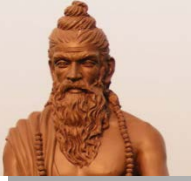
The paper is sponsored by India Discovery Center, Boston, USA.  
Correspondence can be made to BMM at [bmisra@fas.harvard.edu](mailto:bmisra@fas.harvard.edu)



# रससाङ्ख्य

## Summary

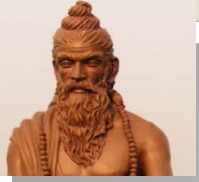
1. The Goal of the Paper
2. Interpretation of *rasa*
3. Philosophical Ideas, *Sāṅkhya* Cosmology
4. Bharata's *Nāṭyaśāstra*
5. Emotion (*rasa*) and its Manifestation
6. The Neurological Findings
7. Our Conceptual Model
8. Discussion
9. Q&A



# रससाङ्ख्य

## The Goal of the paper

1. Understand *rasa* as a phenomenon
2. Study philosophy, psychology and neuroscience
3. Interpret *rasa* through Sanskrit literature
4. Connect *rasa* to emotion
5. Study Bharata's *Nāṭyaśāstra*, *bhāva*
6. Provide neurological findings on emotion
7. Connect "memory imprint" to *bhāva*
8. Build the Model



# रससाङ्ख्य

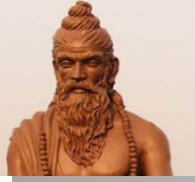
## Interpretation of *rasa*

### 1. *rasa* as Taste

- Concept of taste through literature  
रसनेन्द्रियग्राह्यवस्तुः
- Neurology of Taste

### 2. *rasa* in *Ayurveda*

- Juice of a substance
- *rasa* in human body  
रसायत्त आहार इति तस्मिंश्च प्राणाः (Sushruta)



## रससाङ्ख्य

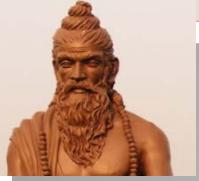
### Interpretation of *rasa* (contd.)

#### 3. *rasa* as Vedic Literature

- Cosmology रसो वै सः
- Bhagavadgītā रसोऽहमप्सु
- Nirukti सदैव सकलं देहं रसतीति रसः स्मृतः

#### 4. *rasa* in Nāṭyaśāstra

- *bhāva* from *rasa*  
योऽर्थो हृदयसंबादी तस्य भावो रसोद्भवः
- Rasa manifestation, types



## रससाङ्ख्य

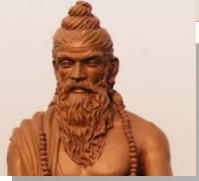
# Philosophical and Psychological ideas

## 1. Mind and Human Psyche

- Spinoza's attributes and God
- Kant's theory of Cognition

## 2. Cosmology of *sāṅkhya* (by Kapila)

- Individual Distinctiveness
- Theory of *guṇa* गुणपरिणामभेदान्नानात्वमवस्थावत्
- *guṇa* manifestation, types



रससाङ्ख्य

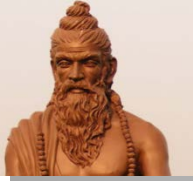
## *bhāva* from Nāṭyaśāstra

### 1. What is *bhāva*?

- Body condition and latency
- Manifestation
- Body function affecting the Mind

### 2. Concept of *Vibhava*

- Environment to aid manifestation
- Cosmological conditions
- Probabilistic in nature



# रससाङ्ख्य *rasa - bhāva*

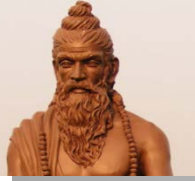
## 1. *rasa* triggers *bhāva*

- *rasa* is psychological
- *bhāva* is physical
- Mutual interaction

## 2. *rasa* absorbs the body through *bhāva*

- शिरोहस्तकटीवक्षः पार्श्वपादसमन्वितः।  
अङ्गप्रत्यङ्गसंयुक्तः षडङ्गो नाट्यसंग्रहः॥
- Facial muscles on emotion
- Body muscles on emotion





रससाङ्ख्य

## The Neurological problem

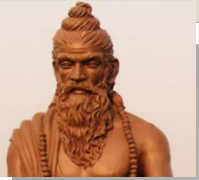
### 1. *rasa* as a stimulus

- Custom reception in an individual
- Neurological thresholds

### 2. Mind-Body interaction

- Rasa stimulus must activate a brain event
- Activated brain must reciprocates to stimulus
- Rasa-bhava reminder

यथा बीजाद्भवेद्वृक्षो वृक्षात्पुष्पं फलं यथा।  
तथा मूलं रसाः सर्वे तेभ्यो भावा व्यवस्थिताः॥



रससाङ्ख्य

# The Neurological Experiments

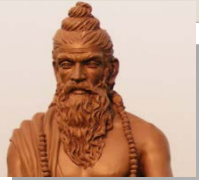
## 1. fMRI Studies

- How they are done
- Research on Mice and Humans

## 2. CREB Protein

*(cAMP response element-binding)*

- Neural activity indicator
- Transcription factor
- Helps record long-term memory and spatial memory



रससाङ्ख्य

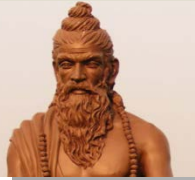
## The Neurological Findings

### 1. Neural Imprints (Engram)

- What are they?
- How are they found?
- Emotion-induced, some could be innate

### 2. Properties of Neural Imprints

- Memory trace - Kim etal (2013)
- Signature of the emotion
- Ablation, Recall and Reactivation



रससाङ्ख्य

## Conceptual *rasa* - *sāṅkhya* Model

### 1. *rasa* channels

- External Stimuli
- Infinity of them, cosmic in nature
- Transmitter and Receptor theory
- Possible manifestation in reception

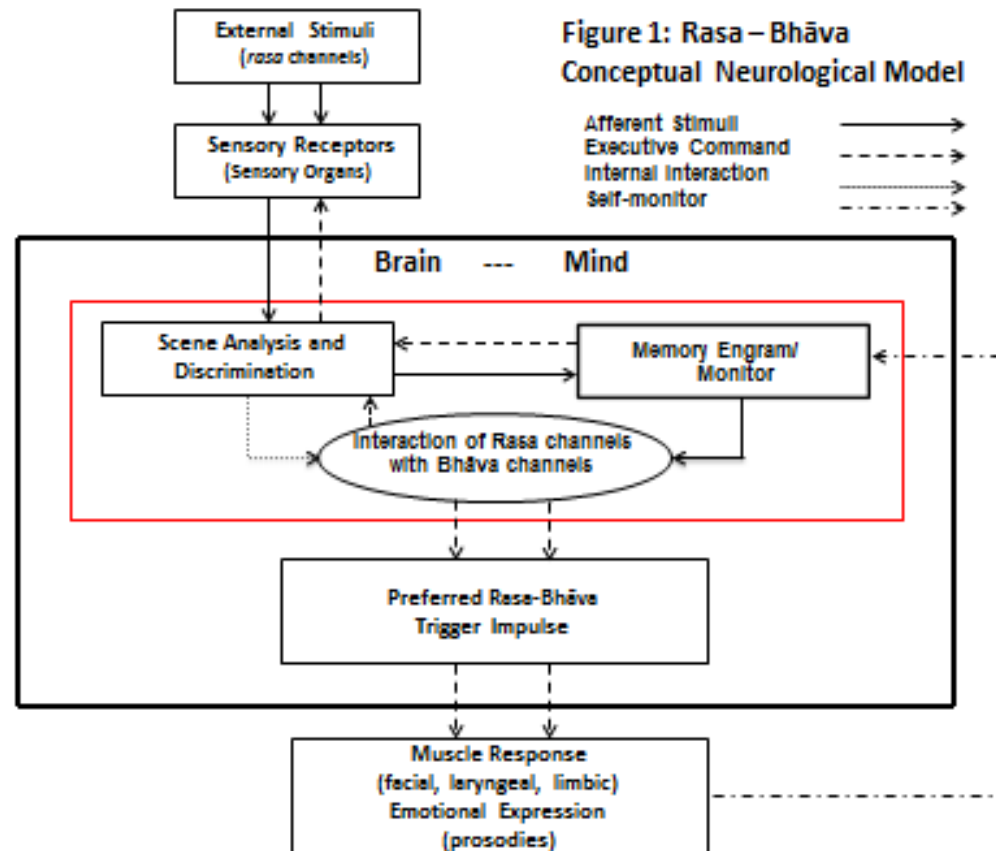
### 2. *bhāva* channels

- Reside in the brain, customized
- Innate channels through *guṇa*
- Intensify through experiences
- Manifest as Neural Imprints



# रससाङ्ख्य

## The Conceptual rasa-bhāva Model

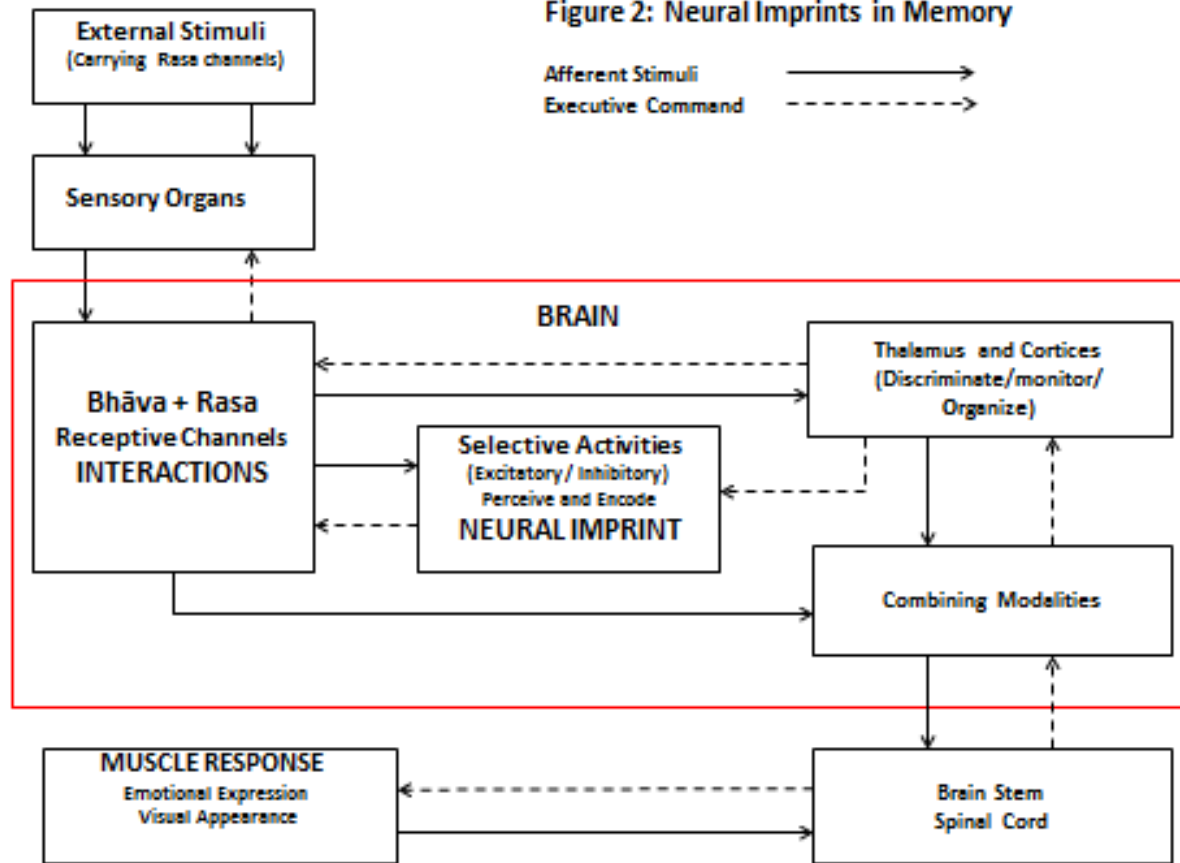


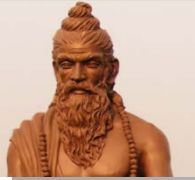


रससाङ्ख्य

# The Neural Imprint Memory Model

Figure 2: Neural Imprints in Memory





रससाङ्ख्य

## *rasa - sāṅkhya* Cosmology

### 1. *sāṅkhya* theory of Creation

- Elements, *bhūta*
- Progression of manifestation
- Add the *rasa* concept in *ap*
- Create a model of cosmic *vibhava*

### 2. *rasa* manifestation

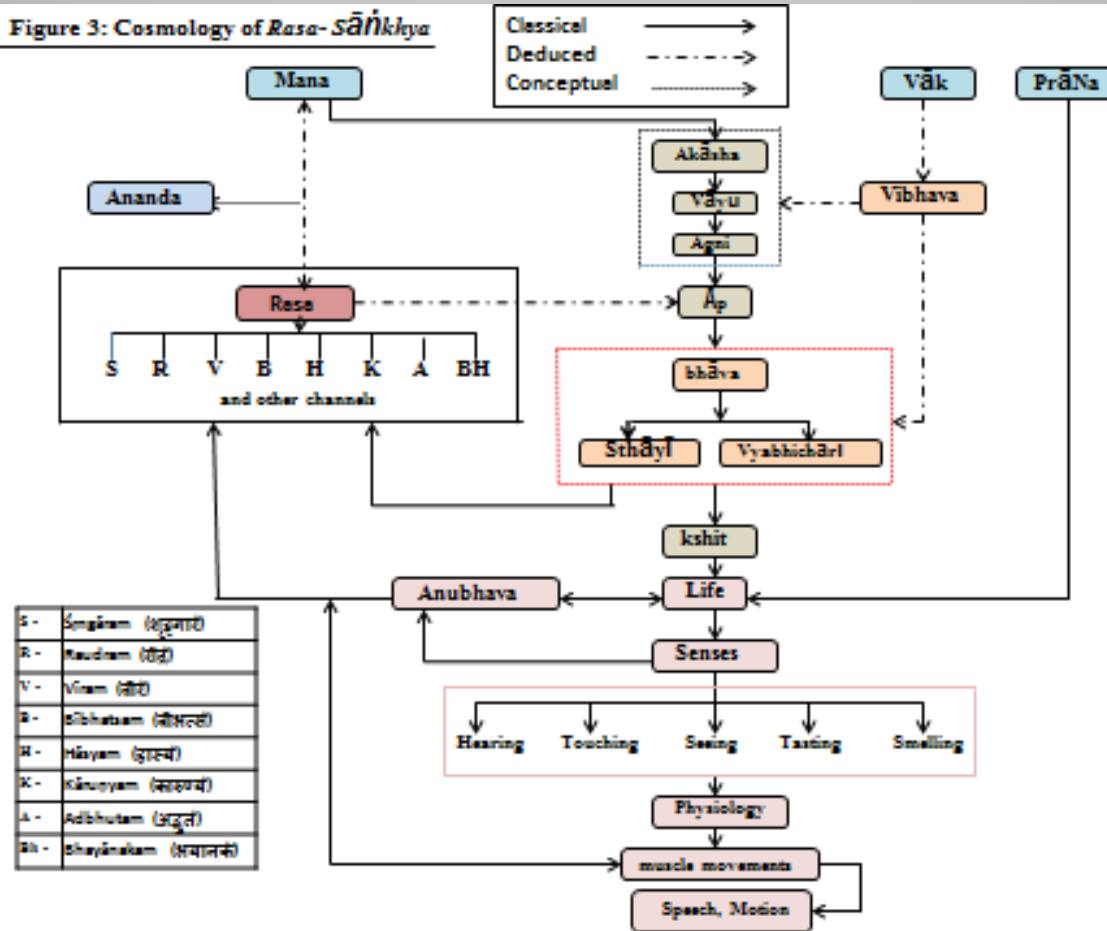
- Assume *rasa* as a tacit cosmic element
- It exists before the solid objects manifest
- It pervades the whole created universe
- It affects the senses and induces *bhāva*



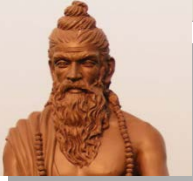
# रससाङ्ख्य

## The Model of *rasa* - *sāṅkhya*

Figure 3: Cosmology of *Rasa-sāṅkhya*







# रससाङ्ख्य

Thank you!