DAAD RISE Reaearch Internship
## Perception and Evaluation of Taste Mixtures

Background. Taste is a principal component of the perception of food and food-related stimuli. It helps us evaluate the edibility of a foodstuff (e.g., a bitter taste could indicate toxicity), and allows us to judge its nutritional value (e.g., sweet taste indicating carbohydrates). Taste perception is also tightly coupled with other mental concepts, such as hedonics (liking) and disgust, and clearly serves an evolutionary purpose. It

therefore plays an integral role in the research of eating-related disorders like binge eating, and is a potential key to a better understanding of the causes of obesity. However, the mechanisms of taste perception in humans are not well understood: Controlled taste stimulation in a laboratory environment is difficult, and only a very small number of research groups focus on taste for that reason. Furthermore, investigations mostly employ "pure" tastes only, while in real-life situations, we usually encounter more or less complex mixtures of different tastes. We are one of the few research groups worldwide with the proficiency and equipment to conduct and analyze experiments employing pure tastes and taste mixtures to gain a better understanding of how, where, and when taste is being processed in the human brain. We use sophisticated computer-controlled stimulation apparatuses and record brain activity via electroencephalography (EEG).

Your project. You will design, implement, conduct, and analyze a study on the perception and neural processing of taste mixtures in humans. You will learn how to come up with an experimental design; how to implement it in the lab, taking advantage of the equipment we provide; how to record data; and how to analyze these datasets. You can chose between two tracks: focusing your study on either psychophysical (adaptive thresholds) or EEG measures. You will be thoroughly guided through each of these steps to ensure your project will be a success.
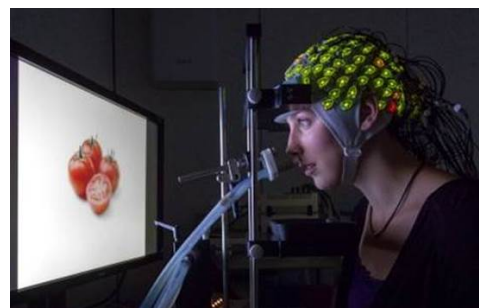
Your opportunity. This project is a great fit if you are interested in cognitive neuroscience in general, and taste perception in particular. You should be eager to learn and apply new techniques that are required to conduct experiments in our lab. This includes programming (Python), acquiring a basic understanding of computer-controlled stimulus delivery and how the involved apparatuses function and interact, as well as conducting basic statistical data analyses. This project will take three months to complete.

Psychophysiology of Food Perception Group. The group investigates the psychophysiological foundations of taste perception and the interaction of taste with other senses relevant to food perception and hedonic valuation (palatability) of food in humans. We offer a stimulating and collaborative research environment and excellent working conditions. The lab hosts a high-density EEG system and state-of-the art taste stimulation systems suitable for EEG and behavioral studies. The institute is located in the metropolitan area of Berlin/Potsdam and allows access to a multitude of seminars, lectures and stimulating meetings at the surrounding institutes, e.g. Charité, Humboldt-University, University of Potsdam, Technical University Berlin, etc.

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For a related publication, see:
Crouzet, Busch & Ohla (2015). Taste quality decoding parallels taste sensations. *Current Biology,* 7:890-896.