

APPLETON INSTITUTE SLEEP RESEARCH FACILITY

The Appleton Institute has a world-class research facility at Central Queensland University's Adelaide campus.

The facility houses two identical accommodation suites. The suites, set-up like serviced apartments, can house up to four participants concurrently, each with their own bedroom, lounge room and bathroom.

Each suite has the necessary equipment to monitor sleep using polysomnography in real-time.

- **Hardware:** Grael Units (Compumedics) and Gold-Cup Electrodes (SureSense).
- **Montage:** Three electroencephalography channels (C4-M1, F4-M1, O2-M1), right and left electrooculography and three channels of chin electromyography
- **Scoring:** Sleep records are manually scored by the same sleep technologist according to the AASM manual for scoring sleep. Standard variables include:
 - Total sleep time [time in any sleep stage (i.e., N1, N2, N3, R) during time in bed];
 - Sleep efficiency [total sleep time divided by time in bed x by 100];
 - Sleep onset latency [time between lights out to the first epoch of sleep];
 - Wake after sleep onset [time in bed awake minus sleep onset latency];
 - Number of arousals [i.e. periods of wakefulness of at least 3 s after sleep onset];
 - Sleep architecture [time in N1 sleep; time in N2 sleep; time in N3 sleep; and time in REM sleep].

The Appleton Institute also houses the capacity to assess aspects of human performance, chronobiology, and fatigue using gold-standard techniques and/or established markers.

- **Body Clock Time**
(e.g., saliva samples for dim light melatonin onset; ingestible capsules to measure and core body temperature minimum)
- **Simple Cognitive Performance**
(e.g., response time, decision making, lapses of attention)
- **Complex Cognitive Performance**
(e.g., high-fidelity and/or desktop driving simulators)
- **Fatigue**
(e.g., sustained attention tasks, maintenance of wakefulness tests, postural sway)
- **Subjective capacity**
(e.g., alertness, sleepiness, positive and negative affect)

