

Jeremy M. Hutson: Publication List, April 2018

Review Articles and Perspectives

228. J. M. Hutson,
"Ultracold Chemistry",
Science 327, 788-789 (2010).
227. J. M. Hutson and P. Soldán,
"Molecular collisions in ultracold atomic gases",
Int. Rev. Phys. Chem. 26, 1-28 (2007). (60 citations)
226. J. M. Hutson and P. Soldán,
"Molecule formation in ultracold atomic gases",
Int. Rev. Phys. Chem. 25, 497-526 (2006). (94 citations)
225. J. M. Hutson,
"Van der Waals molecules",
Chapter C1.4, pp. 2157-2173 in *The Encyclopedia of Chemical Physics and Physical Chemistry*,
ed. J. H. Moore and N. D. Spencer, Institute of Physics, Bristol (2001).
224. J. M. Hutson,
"Coupled channel methods for solving the bound-state Schrödinger equation",
Computer Physics Communications 84, 1-18 (1994). (106 citations)
223. J. M. Hutson,
"An introduction to the dynamics of Van der Waals complexes",
Advances in Molecular Vibrations and Collision Dynamics 1A, 1-46 (1991). (139 citations)
222. J. M. Hutson,
"Dynamics of Van der Waals complexes: beyond atom-diatom systems",
pp. 67-80 in *Dynamics of Polyatomic Van der Waals Complexes*, ed. N. Halberstadt and K. C.
Janda, Plenum, New York (1990).
221. J. M. Hutson,
"Intermolecular forces from the spectroscopy of Van der Waals complexes",
Annual Review of Physical Chemistry 41, 123-154 (1990). (264 citations)
220. A. D. Buckingham, P. W. Fowler and J. M. Hutson,
"Theoretical studies of Van der Waals molecules and intermolecular forces",
Chemical Reviews 88, 963-988 (1988). (545 citations)

Research Papers

219. A. Guttridge, S. A. Hopkins, M. D. Frye, J. J. McFerran, J. M. Hutson and S. L. Cornish,
"Production of ultracold Cs*Yb molecules by photoassociation",
submitted to PRA April 2018; available at arXiv:1804.07319, (9 pages).
218. J. A. Blackmore, L. Caldwell, P. D. Gregory, E. M. Bridge, R. Sawant, J. Aldegunde, J. Mur-Petit,
D. Jaksch, J. M. Hutson, B. E. Sauer, M. R. Tarbutt and S. L. Cornish,
"Ultracold molecules: a platform for quantum simulation",
submitted to Quantum Sci. Technol. March 2018; available at arXiv:1804.02372, (33 pages).
217. V. Barbé, A. Ciamei, B. Pasquiou, L. Reichsöllner, F. Schreck, P. S. Żuchowski and
J. M. Hutson,
"Observation of Feshbach resonances between alkali and closed-shell atoms",
accepted for Nature Physics April 2018; available at arXiv:1710.03093, (6 pages).
216. J. Aldegunde and J. M. Hutson,
"Hyperfine structure of $^2\Sigma$ molecules containing alkaline-earth-metal atoms",
Phys. Rev. A 97, 042505/1-9 (2018).
215. J. Aldegunde and J. M. Hutson,
"Hyperfine structure of alkali-metal diatomic molecules",
Phys. Rev. A 96, 042506/1-4 (2017).

214. D. J. Owens and J. M. Hutson,
“Inelastic losses in radiofrequency-dressed traps for ultracold atoms”,
Phys. Rev. A 96, 042707/1-10 (2017).
213. M. D. Frye and J. M. Hutson,
“Characterizing Feshbach resonances in ultracold scattering calculations”,
Phys. Rev. A 96, 042705/1-8 (2017).
212. A. Bennett, K. Gibble, S. Kokkelmans and J. M. Hutson,
“Atomic clock measurements of quantum scattering phase shifts spanning Feshbach resonances at ultralow fields”,
Phys. Rev. Lett. 119, 113401/1-5 (2017).
211. P. D. Gregory, J. A. Blackmore, J. Aldegunde, J. M. Hutson, and S. L. Cornish,
“The ac Stark effect in ultracold polar $^{87}\text{Rb}^{133}\text{Cs}$ molecules”,
Phys. Rev. A 96, 021402(R) (2017). [Rapid Communication]
Paper selected as an *Editors’ Suggestion*
210. A. Guttridge, S. A. Hopkins, S. L. Kemp, M. D. Frye, J. M. Hutson, and S. L. Cornish,
“Interspecies thermalization in an ultracold mixture of Cs and Yb in an optical trap”,
Phys. Rev. A 96, 012704/1-10 (2017).
209. M. Gröbner, P. Weinmann, E. Kirilov, H.-C. Nägerl, P. S. Julienne, C. R. Le Sueur and J. M. Hutson,
“Observation of interspecies Feshbach resonances in an ultracold $^{39}\text{K}^{133}\text{Cs}$ mixture and refinement of interaction potentials”,
Phys. Rev. A 95, 022715/1-10 (2017).
208. P. D. Gregory, J. Aldegunde, J. M. Hutson, and S. L. Cornish,
“Controlling the rotational and hyperfine state of ultracold $^{87}\text{Rb}^{133}\text{Cs}$ Molecules”,
Phys. Rev. A 94, 041403(R)/1-5 (2016). [Rapid Communication]
207. J. J. Lutz and J. M. Hutson,
“Deviations from Born-Oppenheimer mass scaling in spectroscopy and ultracold molecular physics”,
J. Mol. Spectrosc. 330, 43-56 (2016). (Special Issue in honor of Robert Le Roy)
206. P. K. Molony, P. D. Gregory, A. Kumar, C. R. Le Sueur, J. M. Hutson and S. L. Cornish,
“Production of ultracold $^{87}\text{Rb}^{133}\text{Cs}$ in the absolute ground state: complete characterisation of the STIRAP transfer”,
ChemPhysChem 17, 3811-3817 (2016). (Special Issue on Cold Molecules)
205. D. J. Owens, T. Xie and J. M. Hutson,
“Creating Feshbach resonances for ultracold molecule formation with radiofrequency fields”,
Phys. Rev. A 94, 023619/1-5 (2016).
204. P. K. Molony, A. Kumar, P. D. Gregory, R. Kliese, T. Puppe, C. R. Le Sueur, J. Aldegunde, J. M. Hutson and S. L. Cornish,
“Measurement of the binding energy of ultracold $^{87}\text{Rb}^{133}\text{Cs}$ molecules using an offset-free optical frequency comb”,
Phys. Rev. A 94, 022507/1-8 (2016).
203. M. D. Frye, M. Morita, C. L. Vaillant, D. G. Green and J. M. Hutson,
“The approach to chaos in ultracold atomic and molecular physics: statistics of near-threshold bound states for $\text{Li}+\text{CaH}$ and $\text{Li}+\text{CaF}$ ”,
Phys. Rev. A 93, 052713/1-11 (2016).
202. D. G. Green, C. L. Vaillant, M. D. Frye, M. Morita and J. M. Hutson,
“Quantum chaos in ultracold collisions between $\text{Yb}(^1\text{S}_0)$ and $\text{Yb}(^3\text{P}_2)$ ”,
Phys. Rev. A 93, 022703/1-5 (2016).
201. J. Lim, M. D. Frye, J. M. Hutson and M. R. Tarbutt,
“Modeling sympathetic cooling of molecules by ultracold atoms”,
Phys. Rev. A 92, 053419/1-15 (2015).

200. M. D. Frye, P. S. Julienne and J. M. Hutson,
“Cold atomic and molecular collisions: approaching the universal loss regime”,
New J. Phys. 17, 045019/1-13 (2015).
199. P. K. Molony, P. D. Gregory, Z. Ji, B. Lu, M. P. Köppinger, C. R. Le Sueur, C. L. Blackley,
J. M. Hutson and S. L. Cornish,
“Creation of ultracold $^{87}\text{Rb}^{133}\text{Cs}$ molecules in the rovibrational ground state”,
Phys. Rev. Lett. 113, 255301/1-5 (2014). (96 citations)
198. T. Takekoshi, L. Reichsöllner, A. Schindewolf, J. M. Hutson, C. R. Le Sueur, O. Dulieu,
F. Ferlaino, R. Grimm and H.-C. Nägerl,
“Ultracold dense samples of dipolar RbCs molecules in the rovibrational and hyperfine ground
state”,
Phys. Rev. Lett. 113, 205301/1-5 (2014).
Paper selected as an *Editors’ Suggestion* (130 citations)
197. B. Huang, K. M. O’Hara, R. Grimm, J. M. Hutson and D. S. Petrov,
“The three-body parameter for Efimov states in lithium-6”,
Phys. Rev. A 90, 043636/1-9 (2014).
Paper selected as an *Editors’ Suggestion*
196. H. J. Patel, C. L. Blackley, S. L. Cornish and J. M. Hutson,
“Feshbach resonances, molecular bound states and prospects of ultracold molecule formation in
mixtures of ultracold K and Cs”,
Phys. Rev. A 90, 032716/1-10 (2014).
195. P. S. Julienne and J. M. Hutson,
“Contrasting the wide Feshbach resonances in ^6Li and ^7Li ”,
Phys. Rev. A 89, 052715/1-9 (2014).
194. B. Huang, L. A. Sidorenkov, R. Grimm and J. M. Hutson,
“Observation of the second triatomic resonance in Efimov’s scenario”,
Phys. Rev. Lett. 112, 190401/1-6 (2014).
Paper selected for a *Viewpoint in Physics* at <http://physics.aps.org/articles/v7/51> (56 citations)
193. M. D. Frye and J. M. Hutson,
“Collision cross sections for the thermalization of cold gases”,
Phys. Rev. A 89, 052705/1-5 (2014).
192. C. L. Blackley, P. S. Julienne and J. M. Hutson,
“Effective-range approximations for resonant scattering of cold atoms”,
Phys. Rev. A 89, 042701/1-10 (2014).
Paper selected as an *Editors’ Suggestion*
191. M. P. Köppinger, D. J. McCarron, D. L. Jenkin, P. K. Molony, H.-W. Cho, S. L. Cornish,
C. R. Le Sueur, C. L. Blackley and J. M. Hutson,
“Production of optically trapped $^{87}\text{RbCs}$ Feshbach molecules”,
Phys. Rev. A 89, 033604/1-8 (2014).
190. J. J. Lutz and J. M. Hutson,
“Reactions between cold methyl halide molecules and alkali-metal atoms”,
J. Chem. Phys. 140, 014303/1-9 (2014).
189. M. L. González-Martínez and J. M. Hutson,
“Sympathetic cooling of fluorine atoms with ultracold atomic hydrogen”,
Phys. Rev. A 88, 053420/1-10 (2013).
188. M. L. González-Martínez and J. M. Hutson,
“Ultracold hydrogen atoms: a versatile coolant to produce ultracold molecules”,
Phys. Rev. Lett. 111, 203004/1-6 (2013).
187. M. L. González-Martínez and J. M. Hutson,
“Magnetically tunable Feshbach resonances in $\text{Li} + \text{Yb}(^3P_J)$ ”,
Phys. Rev. A 88, 020701(R)/1-5 (2013). [Rapid Communication]
186. D. A. Brue and J. M. Hutson,
“Prospects of forming molecules in $^2\Sigma$ states by magnetoassociation of alkali-metal atoms

- with Yb",
Phys. Rev. A 87, 052709/1-12 (2013). (33 citations)
185. G. Zürn, T. Lompe, A. N. Wenz, S. Jochim, P. S. Julienne and J. M. Hutson,
"Precise characterization of ${}^6\text{Li}$ Feshbach resonances using trap-sideband-resolved RF spectroscopy of weakly bound molecules",
Phys. Rev. Lett. 110, 135301/1-5 (2013). (79 citations)
184. M. Berninger, A. Zenesini, B. Huang, W. Harm, H.-C. Nägerl, F. Ferlaino, R. Grimm,
P. S. Julienne and J. M. Hutson,
"Feshbach resonances, weakly bound molecular states and coupled-channel potentials for cesium at high magnetic field",
Phys. Rev. A 87, 032517/1-17 (2013). (37 citations)
183. J. F. E. Croft and J. M. Hutson,
"Multichannel Quantum Defect Theory for cold molecular collisions with a strongly anisotropic potential energy surface",
Phys. Rev. A 87, 032710/1-7 (2013).
182. C. L. Blackley, C. R. Le Sueur, J. M. Hutson, D. J. McCarron, M. P. Köppinger, H.-W. Cho,
D. L. Jenkin and S. L. Cornish,
"Feshbach resonances in ultracold ${}^{85}\text{Rb}$ ",
Phys. Rev. A 87, 033611/1-7 (2013).
181. H.-W. Cho, D. J. McCarron, M. P. Köppinger, D. L. Jenkin, K. L. Butler, P. S. Julienne,
C. L. Blackley, C. R. Le Sueur, J. M. Hutson and S. L. Cornish,
"Feshbach spectroscopy of an ultracold mixture of ${}^{85}\text{Rb}$ and ${}^{133}\text{Cs}$ ",
Phys. Rev. A 87, 010703(R)/1-5 (2013). [Rapid Communication]
180. J. F. E. Croft, J. M. Hutson and P. S. Julienne,
"Optimized Multichannel Quantum Defect Theory for cold molecular collisions",
Phys. Rev. A 86, 022711/1-7 (2012).
179. T. Takekoshi, M. Debatin, R. Rameshan, F. Ferlaino, R. Grimm, H.-C. Nägerl, C. R. Le Sueur,
J. M. Hutson, P. S. Julienne, S. Kotochigova and E. Tiemann,
"Towards the production of ultracold ground-state RbCs molecules:
Feshbach resonances, weakly bound states, and the coupled-channel model",
Phys. Rev. A 85, 032506/1-14 (2012). (81 citations)
178. D. A. Brue and J. M. Hutson,
"Magnetically tunable Feshbach resonances in ultracold Li-Yb mixtures",
Phys. Rev. Lett. 108, 043201/1-5 (2012). (37 citations)
177. A. O. G. Wallis and J. M. Hutson,
"Optically induced conical intersections in traps for ultracold atoms and molecules",
Phys. Rev. A 84, 051402(R)/1-4 (2011). [Rapid Communication]
176. M. L. González-Martínez and J. M. Hutson,
"Effect of hyperfine interactions on ultracold molecular collisions:
 $\text{NH}({}^3\Sigma^-)$ with $\text{Mg}({}^1\text{S})$ in magnetic fields",
Phys. Rev. A 84, 052706/1-11 (2011).
175. J. F. E. Croft, A. O. G. Wallis, J. M. Hutson and P. S. Julienne,
"Multichannel Quantum Defect Theory for cold molecular collisions",
Phys. Rev. A 84, 042703/1-9 (2011).
174. M. Berninger, A. Zenesini, B. Huang, W. Harm, H.-C. Nägerl, F. Ferlaino, R. Grimm,
P. S. Julienne and J. M. Hutson,
"Universality of the three-body parameter for Efimov states in ultracold cesium",
Phys. Rev. Lett. 107, 120401/1-5 (2011). (109 citations)
173. W. Skomorowski, R. Moszyński, M. L. González-Martínez and J. M. Hutson,
"Cold collisions of an open-shell S-state atom with a ${}^2\text{II}$ molecule:
 $\text{N}({}^4\text{S})$ colliding with OH in a magnetic field",
Phys. Chem. Chem. Phys. 13, 19077-19088 (2011).

172. L. P. Parazzoli, N. J. Fitch, P. S. Żuchowski, J. M. Hutson and H. J. Lewandowski, "Large effects of electric fields on atom-molecule collisions at millikelvin temperatures", *Phys. Rev. Lett.* 106, 193201/1-4 (2011).
171. S. Tokunaga, W. Skomorowski, P. S. Żuchowski, R. Moszynski, J. M. Hutson, E. A. Hinds and M. R. Tarbutt, "Prospects for sympathetic cooling of molecules in electrostatic, ac and microwave traps", *Eur. Phys. J. D* 65, 141-149 (2011).
170. A. O. G. Wallis, E. J. J. Longdon, P. S. Żuchowski and J. M. Hutson, "The prospects of sympathetic cooling of NH molecules with Li atoms", *Eur. Phys. J. D*, 65, 151-160 (2011).
169. L. M. C. Janssen, P. S. Żuchowski, A. van der Avoird, G. C. Groenenboom and J. M. Hutson, "Cold and ultracold NH–NH collisions in magnetic fields", *Phys. Rev. A* 83, 022713/1-8 (2011).
168. L. M. C. Janssen, P. S. Żuchowski, A. van der Avoird, J. M. Hutson and G. C. Groenenboom, "Cold and ultracold NH–NH collisions: the field-free case", *J. Chem. Phys.* 134, 124309/1-9 (2011).
167. W. Skomorowski, F. Pawłowski, T. Korona, R. Moszyński, P. S. Żuchowski and J. M. Hutson, "Interaction between LiH molecule and Li atom from state-of-the-art electronic structure calculations", *J. Chem. Phys.* 134, 114109/1-16 (2011).
166. P. S. Żuchowski and J. M. Hutson, "Cold collisions of N atoms and NH molecules in magnetic fields", *Phys. Chem. Chem. Phys.* 13, 3669-3680 (2011).
165. P. S. Żuchowski, J. Aldegunde and J. M. Hutson, "Ultracold RbSr molecules can be formed by magnetoassociation", *Phys. Rev. Lett.* 105, 153201/1-4 (2010). (64 citations)
164. P. S. Żuchowski and J. M. Hutson, "Reactions of ultracold alkali metal dimers", *Phys. Rev. A* 81, 060703(R)/1-4 (2010). [Rapid Communication] (116 citations)
163. J. G. Danzl, M. J. Mark, E. Haller, M. Gustavsson, R. Hart, J. Aldegunde, J. M. Hutson and H.-C. Nägerl, "An ultracold, high-density sample of rovibronic ground-state molecules in an optical lattice", *Nature Physics* 6, 265-270 (2010). (195 citations)
162. H. Ran, J. Aldegunde and J. M. Hutson, "Hyperfine structure in the microwave spectra of ultracold polar molecules", *New J. Phys.* 12, 043015/1-20 (2010).
161. A. O. G. Wallis and J. M. Hutson, "Production of ultracold NH molecules by sympathetic cooling with Mg", *Phys. Rev. Lett.* 103, 183201/1-4 (2009). (55 citations)
160. J. M. Hutson, M. Beyene and M. L. González-Martínez, "Dramatic reductions in inelastic cross sections for ultracold collisions near Feshbach resonances", *Phys. Rev. Lett.* 103, 163201/1-4 (2009).
159. J. Aldegunde, H. Ran and J. M. Hutson, "Manipulating ultracold polar molecules with microwave radiation: the influence of hyperfine structure", *Phys. Rev. A* 80, 043410/1-5 (2009).
158. A. O. G. Wallis, S. A. Gardiner and J. M. Hutson, "Conical intersections in laboratory coordinates with ultracold molecules", *Phys. Rev. Lett.* 103, 083201/1-4 (2009).
157. P. S. Żuchowski and J. M. Hutson, "Low-energy collisions of NH₃ and ND₃ with ultracold Rb atoms", *Phys. Rev. A* 79, 062708/1-12 (2009). (48 citations)

156. P. Soldán, P. S. Żuchowski and J. M. Hutson,
“Prospects for sympathetic cooling of polar molecules:
NH with alkali-metal and alkaline-earth atoms – a new hope”,
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155. S. Ghosal, R. J. Doyle, C. P. Koch and J. M. Hutson,
“Stimulating the production of deeply bound RbCs molecules with laser pulses:
the role of spin-orbit coupling in forming ultracold molecules”,
New J. Phys. 11, 055011/1-26 (2009).
154. J. Aldegunde and J. M. Hutson,
“The hyperfine energy levels of alkali metal dimers:
ground-state homonuclear molecules in magnetic fields”,
Phys. Rev. A 79, 013401/1-8 (2009).
153. J. M. Hutson, E. Tiesinga and P. S. Julienne,
“Avoided crossings between bound states of ultracold Cesium dimers”,
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152. J. Aldegunde, B. A. Rivington, P. S. Żuchowski and J. M. Hutson,
“The hyperfine energy levels of alkali metal dimers:
ground-state polar molecules in electric and magnetic fields”,
Phys. Rev. A 78, 033434/1-8 (2008). (62 citations)
151. P. S. Żuchowski and J. M. Hutson,
“Prospects for producing ultracold NH₃ molecules by sympathetic cooling:
a survey of interaction potentials”,
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150. M. P. Deskevich, A. B. McCoy, J. M. Hutson and D. J. Nesbitt,
“Large-amplitude quantum mechanics in polyatomic hydrides:
II. A particle-on-a-sphere model for XH_n (n = 4, 5)”,
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149. M. T. Cvitaš, P. Soldán, J. M. Hutson, P. Honvault and J.-M. Launay,
“Interactions and dynamics in ultracold Li + Li₂ collisions”,
J. Chem. Phys. 127, 074302/1-19 (2007). (51 citations)
148. J. M. Hutson,
“Feshbach resonances in atomic and molecular collisions:
threshold behaviour and suppression of poles in scattering length”,
New J. Phys. 9, 152/1-9 (2007). (55 citations)
147. M. L. González-Martínez and J. M. Hutson,
“Ultracold atom-molecule collisions and bound states in magnetic fields:
tuning zero-energy Feshbach resonances in He + NH (³Σ)”,
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146. M. Lara, J. L. Bohn, D. E. Potter, P. Soldán and J. M. Hutson,
“Cold collisions of OH and Rb. I: the field-free case”,
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145. M. Lara, J. L. Bohn, D. E. Potter, P. Soldán and J. M. Hutson,
“Ultracold Rb-OH collisions and prospects for sympathetic cooling”,
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144. R. J. Doyle, D. M. Hirst and J. M. Hutson,
“Ab initio potential energy surfaces, bound states and electronic spectrum of the Ar-SH
complex”,
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143. M. T. Cvitaš, P. Soldán and J. M. Hutson,
“Long range intermolecular forces in triatomic systems:
connecting the atom-diatom and atom-atom-atom representations”,
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“Ultracold collisions involving heteronuclear alkali metal dimers”,
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140. G. Quémener, P. Honvault, J.-M. Launay, P. Soldán, D. E. Potter and J. M. Hutson,
“Ultracold quantum dynamics: Spin-polarized K + K₂ collisions with three identical bosons or fermions”,
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“Ultracold Li + Li₂ collisions: bosonic and fermionic cases”,
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138. I. N. Kozin, M. M. Law, J. Tennyson and J. M. Hutson,
“Calculating the energy levels of isomerizing tetraatomic molecules. II. The vibrational states of acetylene and vinylidene”,
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136. P. Soldán and J. M. Hutson,
“Interaction of NH molecules with rubidium atoms: implications for sympathetic cooling and the formation of extremely polar molecules”,
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135. M. Meuwly and J. M. Hutson,
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133. P. Soldán, M. T. Cvitaš and J. M. Hutson,
“Three-body non-additive forces between spin-polarized alkali metal atoms”,
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“Quantum dynamics of ultracold Na + Na₂ collisions”,
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“Clusters containing open-shell molecules: III. Quantum five-dimensional / two-surface bound-state calculations on Ar_nOH Van der Waals clusters (X²II, $n = 4$ to 12)”,
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